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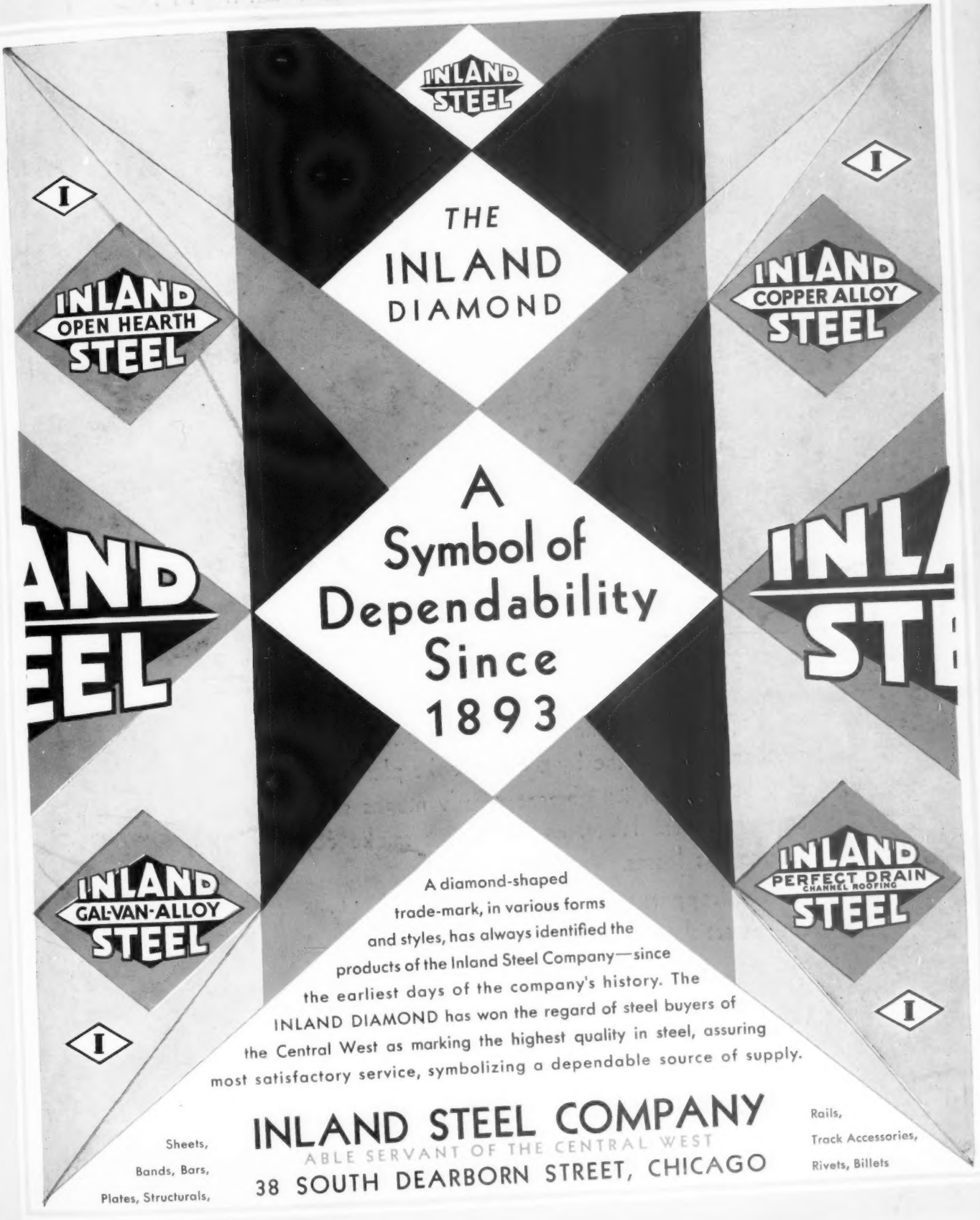
# STEEL

*For forty-eight years*—IRON TRADE REVIEW

May 21, 1931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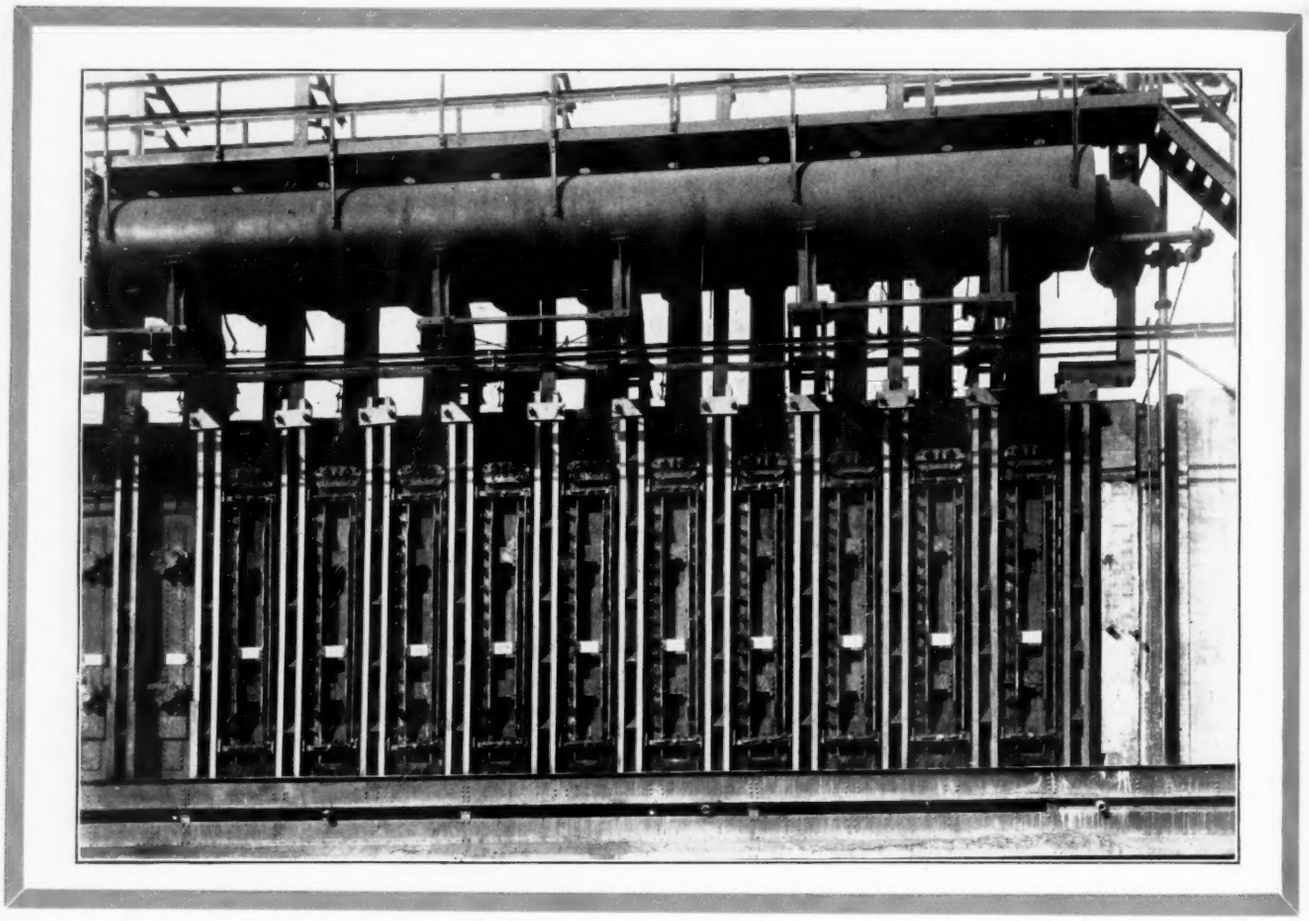

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# CONTENTS

***May 21, 1931***


THIS WEEK IN STEEL ..... 21

- Tells Engineers Neglect of Research Retards Business ..... 23
- Acquires Right to Seamless Tubes by Push-Bench Method 25
- Warehouse Men Seek Ways To Lower Costs ..... 27
- Current Statistics of Steel Industry ..... 28

Industrial Men in the Day's News ..... 29
Obituary ..... 30
Here and There in Industry ..... 31
Mirrors of Motordom ..... 32

EDITORIAL—How Steelmakers Can Add to 1931 Profits ..... 34
THE BUSINESS TREND ..... 35

Monorail Conveyor System Reduces Production Costs ..... 39
Early Blast Furnace Practice Filled with Romance ..... 44
Curve Indicates Specifications for Acceptable Welding Steel .. 49
Automatic Control of Open Hearths Wins Approval ..... 53
Electric Furnace Provides a Flexible Melting Unit ..... 57
Seek Standard Cost Methods for Foundry Industry ..... 57
Remedies Suggested for Surface Checks on Castings ..... 58
Oil-Field Tools Must Have Precise Heat Treatment ..... 61
Corrosion-Resisting Steels Featured at Exhibit ..... 62
Urges British Steelmakers To Develop High-Grade Steels ..... 65
Centrifugal Casting Processes Are Improved ..... 66
Scanning the Technology of Steel ..... 70
Machine Tools and Plant Equipment ..... 75

MARKET SUMMARY ..... 85
MARKET REPORTS AND PRICES ..... 86-116
CONSTRUCTION AND ENTERPRISE ..... 119
NEW TRADE PUBLICATIONS ..... 122
WHERE-TO-BUY DEPARTMENT ..... 123
ADVERTISERS' INDEX ..... 156



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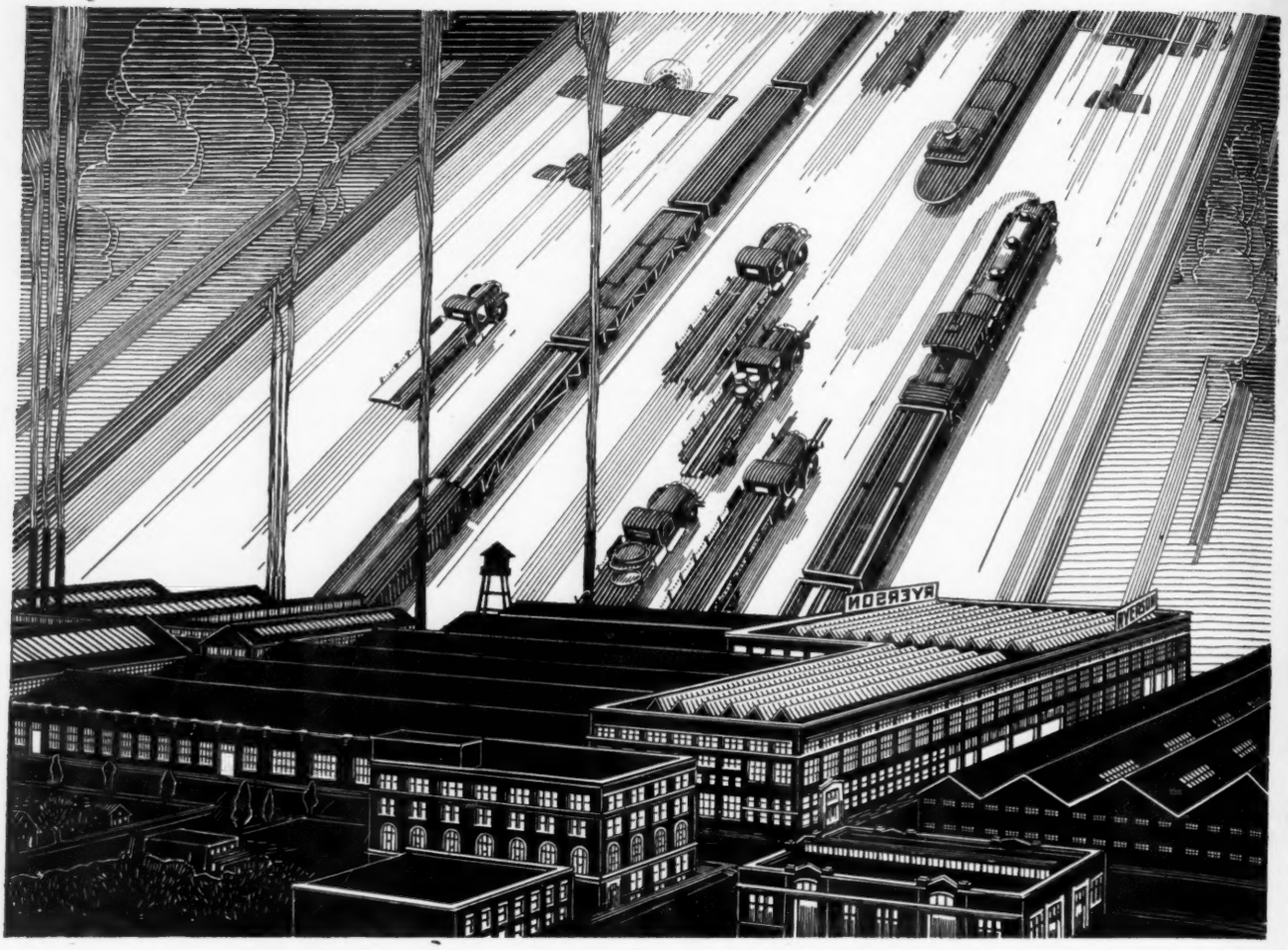

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Volume 88 Number 21

STEEL

*For forty-eight years*—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

# This Week in Steel

IT MAY be, as the quip has it, that business is unable to go forward because it is so dizzy from turning the corner, but this impotence has not won it sanctuary. Rarely has the steel industry been subjected to such searching diagnosis and critical introspection; the situation is producing theories, if not steel.

Research is the specific which the chief of General Motors' laboratories, addressing iron and steel engineers (Page 27), would apply to the current depression. Steel, with other industries, he indicts for being lured by over-production and over-standardization into a morass of stagnation and price-cutting. New ideas, new products, he entreats from the engineers' standpoint, warning that change costs money but lack of change costs even more money and distress.

At the Pittsburgh convention (Page 27) of the American Steel and Heavy Hardware association, henceforth to be known as the American Steel Warehouse association, discussion of the market phase of the depression revolved about twin remedies—reduce costs and budget expenses. Machine Tool Builders, gathered at Old Point Comfort (Page 26), decided to examine instalment sales practice.

Senator Borah, with a legislative complex, is proposing (Page 26) that since recent economic conventions and discussions have not evolved any constructive remedies, industrialists meet this summer to formulate a program of business legislation for the forthcoming congress. But he carefully avoids guaranteeing the legislation.

## Steel Labor Determined, but Conservative

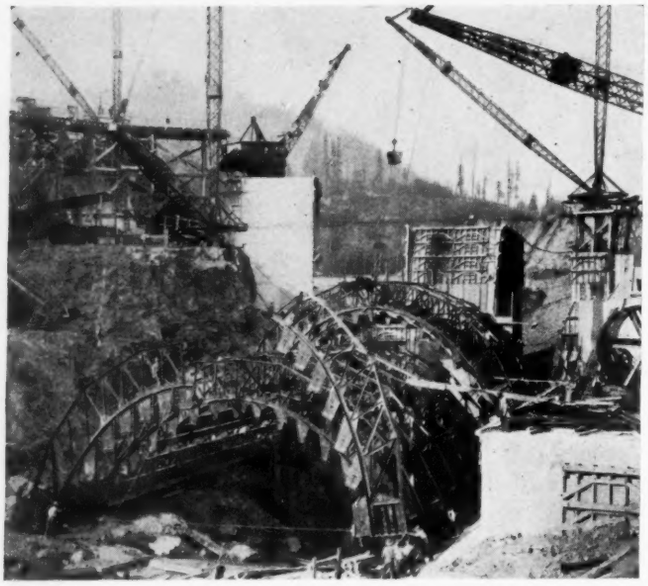
Labor also has been analyzing its position and appears to have concluded it has turned the other cheek often enough. The president of the American Federation of Labor urges (Page 24) that wage reductions be "resisted to the fullest extent"—bellicose words indeed. . . . But in actual practice labor is proving sound and conservative. At Mansfield, O., sheet mill employes last week struck (Page 23) against a reduction, taking pains to avoid violence, ousting the "red" element, shunning the proffered hand of the sheet and tin plate union. A satisfactory compromise was effected. . . . One condition of the settlement was the creation of a liaison committee, which might easily be expanded into a mutual benefit association of the type which the National Industrial Conference board finds (Page 24) a substantial aid in welding capital and labor. . . . The department of labor ominously warns (Page 24) that labor's defense against wage cuts may be demands for increases.

## Welding, Practical and Beneficent

Gear blanks, as well as capital and labor, can now be welded. These blanks, suitable for cut spur, herringbone and helical gears in any size over 24 inches in diameter, are rolled steel parts

—*International Photo*

They call Pittsburgh "the steel city", yet from whatever angle viewed Manhattan is steel's greatest monument. This view shows the Battery



Steel helps to harness Lewis river: Framework is being placed for the Ariel dam, Cowlitz county, Washington. This project is costing $5,000,000, to generate 25,000 horsepower for Inland Power & Light Co., Portland, Oreg.

joined (Page 68) by electric arc welding. . . . Difficulties in welding arising from variable properties of steel have been the subject of a successful research which has evolved (Page 49) a formula which for any required carbon content indicates the correct proportions of silicon, manganese and aluminum to insure the best welding qualities.

## Bridges Help Markets Cross Low Demand

By gentle stages the iron and steel markets are succumbing to the perennial summer apathy, steelmaking operations easing off three points this week (Page 85) to a general average of 44 per cent. . . . Resisting this soporific influence more vigorously than any other major outlet for steel is building. Including more than 58,000 tons for a bridge at New Orleans, which was up for bids June 4 but is deferred, and 30,000 tons for an Ohio river bridge, fresh inquiry this week mounted (Page 90) to 108,333 tons. . . . Tin plate mills, operating half again as well as other steelmaking departments, are the envy of British producers (Page 112), who visualize stimulating the canning industry in the British Isles as a shortcut out of difficulties.

## 5,000,000 Cars and No Profit?

One week's decline may not establish a trend, but with general business conditions not improving Detroit is apprehensive that the spring peak in passenger car production is passing. The situation in the automobile industry (Page 32) is that Chevrolet and Ford lead the procession at an unchanged rate, with Chevrolet still about a fender ahead of Ford, while among a number of other manufacturers there is a tendency to drop back. . . . Detroit, still inquisitive concerning Ford's plans, is speculating whether any official tears will be shed on the revising of Model A. Superficially (Page 33) it cost $150,000,000 to bring it out; in the making of 5,000,000 the net profit, apparently, has been $56,000,000, according to the meager Ford financial report.

## Needed: A Pipe Line Into Banks

Could pipe line promoters corral some of the funds supposed to be straining the sidewalls of bank vaults, steelmaking operations would rise five points over night. This week's awards of steel pipe, while almost 30,000 tons (Page 95), represent only a fraction of pending, financeless work. . . . Anticipating happier days, a mill equipment manufacturer has obtained (Page 25) American rights to the modernized Ehrhart or push-bench method of producing seamless tubes. One installation in the United States already is under way. . . . Cast iron pipe now is being annealed at 1700 degrees Fahr., and in the construction (Page 66) of modern annealing furnaces the various chrome-nickel heat-resisting alloys are an aid.

## British Stake Future on Quality

British steelmakers, taking stock of their position, have concluded (Page 65) they will not try for tonnage nor attempt to compete with the Continent in the manufacture of ordinary carbon steels. They have ruled out a revival of the basic-bessemer process and the large open-hearth furnace for melting heats of high-grade steel, but will perfect slower processes for making high-grade steel. . . . In this country the effort is to build up the efficiency of the open-hearth furnace as well as increasing the output of the quality steels. Open-hearth engineers at a recent meeting (Page 53) took steps to eliminate air leaks, approval of combustion control necessitating tight furnaces.

## Moss Grows Where Hearths Blazed

A century ago the charcoal iron industry, as typified by the old stone furnaces, was thriving; today heaps of stone and moss-covered paths are the only reminders. Interesting accounts of early ironmaking are bound up (Page 44) with these old furnaces. . . . In contrast with these ruins, nothing is more modern than the overhead monorail conveyor system of an important eastern manufacturer (Page 39) of doors for all-steel automobile bodies. In this plant alone are more than two miles of conveyors, capable of handling 20,000 doors daily. . . . Despite the burden of over-production, the oil industry continues to make progress technically. Heat-treating is resorted to increasingly (Page 61) in producing efficient drilling tools.

# Tells Engineers Neglect of Research Retards Business

STAGNATION and over-standardization, not mechanization, have caused the present business depression, declared C. F. Kettering, vice president of the General Motors Corp., Detroit, in addressing the iron and steel meeting of the American Society of Mechanical Engineers at Detroit, May 14.

"The postwar years constituted the greatest decade in production in the history of the country," said the chief of General Motors' research laboratories. "The war bequeathed us great capacity. Everyone has been intent on utilizing it.

"While we were concentrating on production we were neglecting research and development. We were afraid they would interfere with production. We got into the fool rut of believing the markets for goods were indefinitely elastic; that we just had to cut the price, beat the tom-toms, and the markets would go on forever.

**Points to Price Cuts**

"We got the notion that all useful ideas had been used up and we were going to remain static for 25 years. We acquired a complex of standardization; we began to make everything alike; there was nothing to differentiate one product from another or to make an appeal to our pocketbooks. Because we standardized we elevated price to a place of major consideration, resulting in cut-throat competition.

"The decade after the war may be likened to a great parade of industry down the avenue, headed for a triumphal arch on which is the word 'standardization.' So intent has industry been on standardization that it has not turned and read the words on the reverse side of the arch—'This is the home of cut-throat competition and no profit.'

"The object of research is to keep everyone reasonably dissatisfied with what he has. Research is finding out what you can do when you can't do the things you have been doing. Change costs money, but it costs more in money and distress not to change.

**"Not Everything Solved"**

"The banks are bursting with money which people will not spend because there is nothing to entice them. Never has it been so hard to sell ideas as now. We have been waiting for business to come back as in 1929, but it won't. In New York the other day they offered moderate-price television sets and had to call the police to keep purchasers in line.

"I wish I could erect a billboard, for all the people, in front of every executive office in the country. I would put on it: 'When you make the stuff we want we'll buy it, but we're tired of your old, standardized goods'.

"The world is not finished. The iron and steel industry has not solved everything—far from it—because we still have trouble with your material."

**Clauss Describes Development**

At the morning session, presided over by C. W. Bennett, vice president, American Sheet & Tin Plate Co., Pittsburgh, the development of the Great Lakes Steel Corp., Detroit, a division of the National Steel Corp., was related by Julius A. Clauss, chief engineer of the Great Lakes corporation.

Will H. Baltzell, chief engineer, Canadian Steel Corp., a subsidiary of the United States Steel Corp., described the present status of the Canadian corporation's works at Ojibway, Ont., across the river from Detroit.

At the dinner meeting, in addition to Mr. Kettering, E. S. Evans, president of the Detroit chamber of commerce, ascribed Detroit's industrial growth largely to the American Plan and the absence of the closed shop.

F. W. Manker, of the Great Lakes corporation, responded to a welcome extended to the steel industry by various speakers, including S. Wells Utley, president of the Detroit Steel Castings Co. and of the Michigan Manufacturers' association.

About 200 engineers and visiting steel men inspected the plant of the Great Lakes corporation.

## Freyn Engineers To Build Steel Foundry in Russia

Chicago—Freyn Engineering Co. engineers, now in soviet Russia, will assist in the construction of an 80,000,000-ruble ($40,000,000) rolling mill, forging shop and steel foundry to be started at Leningrad, the last important unit under the five-year plan. Capacity will be 400,000 tons yearly. Construction includes a number of open-hearth furnaces.

The Soviet Economic council is financing the project, which is to be completed in two years. Freyn Engineering Co. has 60 engineers in soviet Russia, and work on the new plant will be under the original contract made by the engineering company with the soviet government for technical services for the five-year plan.

## Empire Strike Settled As Wage Cut Is Cancelled

A wage reduction, a strike, cancellation of the wage reduction, and return of the strikers all occurred within six days last week at the Empire Steel Corp.'s plant at Mansfield, O. It was one of the few strikes incidental to the industrial depression, and was notable in several respects.

The 1600 employes of the sheet mills, open-hearth department and blooming mills were unorganized, yet they walked out in a body. They did not leave any material or equipment

*International Newsreel Photo*

*WHAT GOES UP MUST ALSO COME DOWN, APPLIES TO STEEL*

*Steel rises in skyscrapers and dives in submarines. The new navy submarine Nautilus, not to be confused with the pole-exploring submarine of Sir Hubert Wilkins, shown passing under Brooklyn bridge*

in condition to be spoiled or damaged as a result of their absence. There was no disorder.

The strikers refused to "sign up" with the Amalgamated Association of Iron, Steel and Tin Workers. They expelled from their meetings a few "reds" who tried to speak to them. They elected representatives to confer with company officials, and among their "demands" was one for permanent committees for contact between themselves and the management on future questions pertaining to work and compensation.

The strike started Monday afternoon, May 11, when the company posted notice of a reduction of 10 per cent for most of the workmen, and an additional 5 per cent for those in certain hot-mill departments. The Empire corporation's employes at its Falcon mill at Niles, O., on May 1 received an increase of 1½ per cent, in accordance with the bi-monthly settlement with the Amalgamated association, the workmen of that plant being organized. The corporation explained that employes at Niles were working only part time, while those at Mansfield were working practically full time.

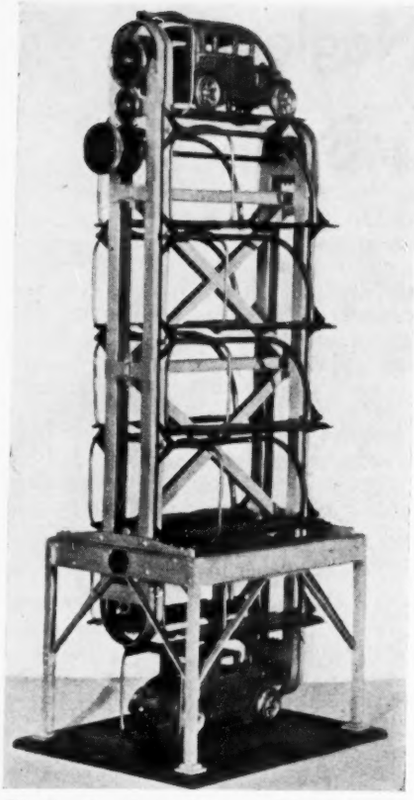
After considering the problem several days the corporation rescinded its order, and increased common labor from 32 cents to 36 cents an hour. The strikers demanded 40 cents for common labor. The trouble was settled by Saturday and the men were back at work.

## Sheet Wage Conference On; 6-Hour Day Is Sought

Atlantic City, N. J.—Representatives of the Amalgamated Association of Iron, Steel and Tin Workers and the Western Sheet and Tin Plate Manufacturers' association began their annual wage conference here May 18. The Amalgamated association is renewing its request, the same as made at previous annual meetings, for a 6-hour day in sheet and tin plate mills. Failing to obtain this it will concentrate its efforts to obtain a renewal of the wage scales in present contracts which expire June 30. The Amalgamated association and Western Bar Iron association renewed contracts without the formality of a conference.

## Industrial Employment Shows More Stability

Washington—An increase of 0.2 per cent in employment in 15 industrial groups is reported by the bureau of labor statistics for April, in comparison with March. Monthly payroll totals for the same groups decreased 1.5 per cent. In manufacturing industries employment declined 0.4 per cent, and payroll totals 1.6 per cent.



*Steel not only makes possible the automobile but must also park it. An ingenious automatic device, of steel, developed by H. D. James, consulting engineer of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., parks 24 cars in the ground space of a double garage*

The reduction of 0.4 per cent was slightly less than the average of decreases in April from March in seven of the nine years covered by the bureau's indexes.

Per capita earnings in manufacturing industries were 1.2 per cent less than in March. The index for employment in iron and steel manufacturing was unchanged in April, while payroll totals were down a half point.

## Administration Backs Labor, Against Wage Cuts

Washington—"Rumblings" of wage cuts have led the administration through Secretary of Labor William N. Doak to issue a warning that if industries fail to keep their pledge to President Hoover, organized labor will be released to demand increases.

"We do not believe that large and general industries are considering wage reductions, although we have heard rumblings," said Mr. Doak. "Any campaign to slash wages will be considered a violation of confidence and of the pledge that industrial leaders made to President Hoover in 1929, and will justify labor in asking for increased pay."

Mr. Doak stated the administration is resisting wage cuts with every means at its command, and that so far there has been a remarkable absence of discord and strikes, a few having occurred when building contractors this month sought to reduce wage rates. He was in touch with railroad executives and said they were opposed to wage reductions, and he was convinced the steel industry was taking a similar stand.

Mr. Doak's warning followed one issued by the American Federation of Labor last week in which "certain bankers and industrialists" were charged with instigating wage reductions. The federation's executive committee named two companies, both in the rubber industry. The present depression, it stated, will be indefinitely prolonged if such a course becomes general.

## Benefit Associations Have Large Membership

Mutual benefit associations in industry have not only survived active competition of private insurance companies but are an important element in the relationship between employer and employe, according to the National Industrial Conference board, New York.

"These associations have brought together in an organized way the best thought of working force and management in an effort toward constructive solution of a problem that both recognized, but that was beyond the sphere of ordinary employer-employe relationship," the board states. "In this way benefit associations laid the foundation for modern industrial relations and made the introduction of more recent activities simpler."

The board study is based upon information received from 388 companies which showed that in the aggregate they employed 1,119,226 wage earners, of whom 824,941, or about 74 per cent, were members of their mutual benefit associations.

## Industrial Pensions Have Widest Coverage

Among various measures intended to provide financial security for the aged the most significant are those developed by private industry, according to a survey by the National Industrial Conference board, New York. While 12 states at the close of 1930 had old age pension laws the payments are so small as hardly to deserve the name of pensions. They are mere pittances, and in several of the states the laws are almost dead letters because the public has no desire to take advantage of them.

Industrial pensions were found to have a wider coverage than any of the other systems. They are primar-

ily significant because they apply to that class of individuals which contribute the largest proportion of social dependents, old age making greater inroads upon physical than upon mental capacity for work.

## Testing Materials Society Plans First Congress

F. O. Clements, technical director, research laboratories, General Motors Corp., Detroit, has been nominated to be president of the American Society for Testing Materials for the coming year. For vice president, S. T. Wagner, consulting engineer, Reading Co., Philadelphia, is named.

Nominations for membership on the executive committee are: Arthur W. Carpenter, manager of testing laboratories, B. F. Goodrich Co., Akron, O.; K. B. Cook, technical manager, Manville Jenckes Co., Pawtucket, R. I.; G. C. D. Lenth, consulting engineer and secretary, Clay Products association, Chicago; O. L. Moore, engineer of tests, Universal Atlas Cement Co., Chicago; and J. B. Johnson, chief, material section, Army air corps, Wright Field, Dayton, O.

Election will take place by mail ballot, to be announced at the annual meeting of the society in Chicago, June 22-26, but nomination virtually insures election.

## Trees Honor Westinghouse

Pittsburgh—The first of 40 Japanese cherry trees, tribute of the Westinghouse Society of Japan to the memory of George Westinghouse, was planted near the Westinghouse memorial in Schenley park, Pittsburgh, May 9. F. A. Merrick, president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and a member of the Westinghouse memorial trustees, was chairman.

## Allegheny Extends Rights

Allegheny Steel Co., Brackenridge, Pa., has made an agreement with the General Alloys Co., Boston, whereby the latter company receives privilege to manufacture under the Allegheny trade name any of the various alloys now made by the Allegheny company.

## Is Completing Improvements

Birmingham, Ala. — Development program at Fairfield and other points by Tennessee Coal, Iron & Railroad Co., including large addition to sheet mill, new 140-ton open-hearth furnace and other rounding out of steel mills, begun last spring, will be completed shortly.

# Acquires Right To Seamless Tubes by Push-Bench Method

AMERICAN rights to the modernized Ehrhart or push-bench method for producing seamless tubes have been acquired by the Aetna-Standard Engineering Co., Youngstown, O. The arrangement was effected with a recognized leading English engineering and manufacturing organization which has specialized in this type of tube mill equipment.

The push-bench method, now being used in England, Germany, Poland and South Africa, has aroused considerable interest from American tube makers. A Canadian installation now is in the course of construction and will be placed in operation during the coming summer. Another installation, for a prominent American tube maker, will commence operations at a later date.

### Power Increase Is Slight

The new method, it is said, will produce seamless tubes from bessemer or open-hearth steel with equal facility and no difficulties are experienced in making alloy or corrosion-resistant steel tubes, although the power consumption is slightly higher.

In the process, square billets are heated in a continuous-type furnace. The heated square billets are placed in a vertical press and punched into a round bottle or thimble-shaped billet, this operation having a beneficial effect on the steel. It may be classed as a forging operation in which the material is improved.

The round or thimble-shaped billet is then placed on the end of a mandrel and pushed through a series of dies or rings in which reductions are taken successively until the required diameter is obtained. The tube on the mandrel bar next is reeled, this operation cross rolling the tube and giving it a highly finished surface and at the same time loosening the tube on the mandrel bar.

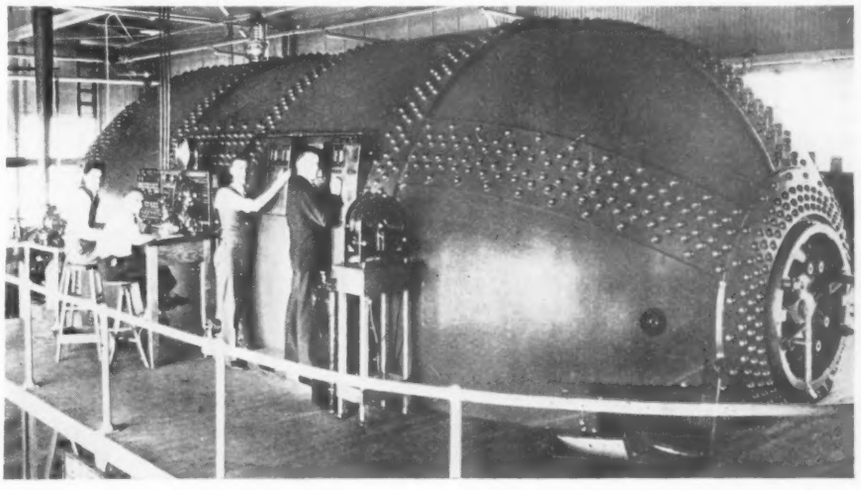
A chain-driven bench extracts the mandrel bar, the tube is ejected and the mandrel bar returned to the mandrel handling device. The tube then may be sized or reduced as required by the usual finishing operations.

Acquisition of the American rights to the process will permit the Aetna-Standard company to combine experience of the English manufacturer as to design, disposition, plant layout and operation of push-bench equipment with its own experience in the design, manufacture and layout of equipment of the automatic or Steifel process now widely used in this country.

## New Jersey Again Seeks Lower Rates Than New York

New York—A hearing is under way here before the interstate commerce commission in connection with the application of New Jersey shippers to break up the unit freight rate now charged to all points in the port district and to replace it with a lower rate for the New Jersey side than for points in New York.

This is the third hearing, the first being in Newark, N. J., in June, 1930,



*—International Newsreel Photo*

*STEEL ENABLES MAN TO STUDY NATURE'S WORST MOODS*

*This enclosure for the wind tunnel at the laboratory of the National Advisory Committee for Aeronautics at Langley Field, Va., has assisted in advancing the science of the air*

and the second following later in Boston, that port also being involved. These hearings bear not only on rates put into effect last May on iron and steel products but also on the case dealing with the western trunk line rates, including both class and commodity rates, and the case dealing with class rates in classification territory. Recently, the commerce commission postponed the effective date of these rates from June 15 to Dec. 3.

Testimony in the present hearing, so far principally by high state and civic officials, is that the action of New Jersey menaces Greater New York's investment of more than $600,000,000 on the New York side of the port.

The action of New Jersey interests is predicated on the belief that the ruling of the commerce commission which gives northern New Jersey manufacturers the same rate as New York, which lies beyond in relation to the principal points of origin, is unfair inasmuch as they are subject to additional charge specified to cover special costs of lighterage, trucking, etc., in New York City. This latter charge takes the form of a cost based on a rate for 10 miles beyond the New Jersey rail heads.

## Rock Drill Steel Awarded

Boulder City, Colo. — Crucible Steel Co. has been awarded approximately 1000 tons of rock drill steel for drilling work on the Hoover dam, including four 50-foot tunnels, Black Canyon, by Six Companies Inc., general contractors.

## Tool Builders May Broaden Scope of Organization

Old Point Comfort, Va.—Active possibility of broadening the scope and influence of the National Machine Tool Builders' association by expanding it into an industrial machinery institute open to all industrial machinery builders was suggested by President Carl A. Johnson before the thirtieth spring meeting here, May 18-19.

Much discussion centered around management problems in the machine tool industry on account of the extreme and frequent fluctuations which continue to confront it. Sharp discussion also arose in connection with installment sales practices and, as an outcome, a committee is to be appointed to survey and report on the situation.

Consolidated reports indicate a sound condition of member companies, in marked contrast to the situation in the difficult 1921 depression period.

## Engineers To Fight Dole

Washington—The American Engineering council has adopted a program aiming to focus the best thought of the engineering profession upon the problem of unemployment. One phase of this program will be to combat, through its 26 constituent societies, all effort to enact unwise laws looking to the introduction of the dole in congress or in the state legislature. Attempts to impose unemployment insurance which would in effect constitute a dole will be fought.

# Financial News of Steel Industry

AMERICAN ROLLING MILL CO., Middletown, O., reports net loss of $663,049 for first quarter, after all charges including taxes. This compares with net profit of $730,404 in the March quarter of 1930, equal to 51 cents for each of 1,428,698 common shares.

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Ludlum Steel Co., Watervliet, N. Y., reports net loss of $16,357 for the first quarter. For the first quarter of 1930, Ludlum reported net loss of $49,843.

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Superior Steel Corp., Pittsburgh, reports net loss of $144,428 in the March quarter, compared with net loss of $73,380 in the corresponding period of 1930.

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Follansbee Bros. Co., Pittsburgh, reports net loss of $203,956 after depreciation, depletion and other charges for the first quarter, compared with net loss of $99,072 in the March quarter of 1930.

□ □ □

National Supply Co., Pittsburgh, and subsidiaries including Spang, Chalfant & Co., report net loss of $1,186,211 for first quarter. Compared with this showing was earning of 40 cents a share, or net of $174,830 for March quarter of 1930.

## Win Guessing Contest

Winners in the guessing contest conducted by the Pangborn Corp., Hagerstown, Md., during the recent exhibition of the American Foundrymen's association in Chicago, have been announced as J. K. Adams, Barrett Christie Co., Chicago, and J. R. Scholes, Sivyer Steel Castings Co., Chicago.

The contest was to guess the number of abrasive grains passing through the orifice of a large hour glass in 5 minutes. Mr. Adams guessed 3,437,400 and Mr. Scholes 3,400,037.

## Closes Spencer Works

Worcester, Mass.—The Wire Village plant of the Wickwire Spencer Steel Co. at Spencer, Mass., said to be the oldest wiremaking plant in the country, is to be abandoned. Machinery will be shipped to the other Wickwire plants at Worcester and Palmer, Mass., and Buffalo beginning about June 1.

# Would Tighten Ban on Alien Labor; Business News of Washington

SECRETARY of Labor Doak stated in a recent speech that the administration is making every effort toward protecting the rights of citizen workers from the invasion of foreign labor. He said that laws further limiting immigration should be enacted.

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Vessels engaged in our foreign commerce made nearly 60,000 entrances and clearances through United States ports during 1930, according to the research bureau of the shipping board.

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Thomas E. Robertson, commissioner of patents, announces that applications for patents relating to chemistry comprise one eighth of the issuance activities of his department.

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The next session of congress will be asked for additional protection for American coastal trade by domestic shipping interests, according to A. J. Tyrer, commissioner of navigation, department of commerce.

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Recent meetings of business men have not evolved any particular legislative program, Senator Borah says, and he suggests that this summer industralists should get together and formulate a program for business legislation for the next session of congress.

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Brig. Gen. Benedict Crowell, assistant secretary of war during the world war, appearing before the war policies commission, advocated war plans that would provide for fixing maximum prices for commodities essential to war, and congressional legislation establishing an excess profits tax to safeguard against profiteering in wartime.

# Warehouse Men Seek Ways To Lower Costs; Change Name

DISTRIBUTORS of steel and heavy hardware, attending the twenty-second annual meeting of the American Steel and Heavy Hardware association at Pittsburgh beginning May 18, heard a report of their cost of doing business committee and turned to concrete discussions of ways and means to reduce costs and to increase profits.

The report, presented by G. K. Conant, Sligo Iron Store, St. Louis, showed the industry on the whole suffered an average loss of 74 cents on every $100 in gross sales during the calendar year 1930.

For the preceding seven years members showed a profit ranging from 4 cents in 1924 to $4.67 in 1923, the 1929 figure being $2.36 net profit on every $100 gross sales.

## Association Changes Name

*AMERICAN Steel Warehouse association is the new name of the American Steel and Heavy Hardware association, adopted at the convention at Pittsburgh, May 19. The stated aim of the association is to enhance the common interests of steel distributors and establish closer co-operation with the mills.*

Sales declined 30 per cent in 1930 compared with the preceding year and expenses increased from $24.36 to $27.41 for each $100 sales.

Rather drastic measures to cut expenses taken by many of the members late in 1930 served to check losses in many instances. Economy measures embraced reductions in wages and salaries, paring of sales forces, shortened working hours, and numerous efficiency steps in plants and offices.

Elimination of unprofitable items continues apace in the industry, the effect of this policy being reflected in the turnover for the year. This figure, 3.07, while considerably lower than it was in 1929, is higher than in 1928, and noticeably greater than in 1923 or 1924.

The opening meeting May 18 was featured by an address on "Industrial Pittsburgh," by L. H. Burnett, vice president, Carnegie Steel Co., Pittsburgh; and by an outline of the moves the bolt and nut manufacturers are taking to reduce their expenses and to improve their service. This summary was presented by George S. Case, president, Lamson & Sessions Co., Cleveland.

At this meeting the president of the association, R. H. Sanderson, Cutter, Wood & Sanderson, Cambridge, Mass., gave his annual report. Reports also were presented by W. J. Holliday, W. J. Holliday & Co., Indianapolis, chairman of the executive committee; by B. R. Sackett, secretary of the association; and by S. L. Orr, Orr Iron Co., Evansville, Ind., chairman of the legislative committee.

"The basis for the economy which will eventually bring back prosperity is the budgeting of expense down to the smallest detail," Mr. Case told members of the association. Most of this economy, he pointed out, has been made without cutting wages of productive labor, except by shortening hours.

In his own plants the hourly rates are actually higher today than they were a year ago and the production per man hour has been increased far more than the hourly cost of labor, Mr. Case reported. This has been accomplished by better schedules, better working arrangements, and to a slight degree, by better equipment. Cuts have been made in larger executive salaries.

### Would Modernize Methods

"Business for Profit" was the title of the address by Dr. Frank M. Surface, assistant director, bureau of foreign and domestic commerce. Dr. Surface emphasized the necessity for business thinking adapting itself to the rapidly recurring changes that now characterize industry. Business methods, in his opinion, are not as modern as business equipment. Through co-operative thinking and working industry must strive to overthrow a situation that makes 90 per cent of the profits of an individual enterprise dependent upon business conditions and only 10 per cent upon individual initiative and effort, said Dr. Surface.

He then showed how the department of commerce is endeavoring to help business in its thinking by supplying pertinent facts upon which executives may base their future judgment. By aggressively attacking the problems of distribution, the department is striving to assist in the elimination of wasted effort, and at the same time it is undertaking to show how the present inadequate methods of cost accounting in the field of distribution can be supplanted with really accurate appraisals.

G. F. Ahlbrandt, general manager of sales, American Rolling Mill Co., Middletown, O., said merchandising is the outstanding problem of the industry. He urged a program to enlarge present markets, saying it is not necessary to get more customers but to make the present ones better.

Mutual effort is needed to eliminate friction between warehouses and mills, he said, suggesting the discontinuance of pool car shipments by mills, a sizable extra for less-carload mill shipments, jobbers to quit soliciting carload orders and direct mill shipments of less-carload orders to cease. Mr. Ahlbrandt asked jobbers to stay within their legitimate territory.

Establishment of mill extras on small quantities of shapes and plates similar to differentials now applying to hot-rolled bars was suggested, and a resolution to appoint a committee to discuss this with the mills was adopted.

Much discussion centered on the marketing of cold-finished steel and cutting extras. No solutions were offered for the problem of direct mill competition on orders under 1000 pounds nor any progress made toward the goal of a uniform national schedule of cutting charges.

The 20th annual convention of the National Association of Sheet Metal Distributors, affiliated with the National Hardware Association of the United States, was being held in Pittsburgh, May 20-21.

## Officers Elected

**AMERICAN STEEL WAREHOUSE ASSOCIATION**

**President**
W. J. HOLLIDAY
W. J. Holliday & Co., Indianapolis

**First Vice President**
GUY P. BIBLE
Horace T. Potts & Co., Philadelphia

**Second Vice President**
CLARENCE C. DODGE
George F. Blake Inc., Worcester, Mass.

**Executive Committee**
C. C. HARVEY
Arthur C. Harvey Co., Boston
LESTER BRION
Peter A. Frasse & Co. Inc., New York
A. J. DIETRICH
Dietrich Bros., Baltimore
A. R. PURDY
A. R. Purdy Co. Inc., New York
C. P. ROGERS
Beals, McCarthy & Rogers, Buffalo
L. H. WILLIAMS
Williams Hardware Co., Minneapolis
LESLIE EDGCOMB
Edgcomb Steel Co., Philadelphia

**Secretary-Treasurer**
B. R. SACKETT
505 Arch street, Philadelphia

## April Machine Tool Orders Show Declines

Index of total actual gross orders for machine tools in April fell off from March, but still was second high since October, 1930. Greatest percentage drop was in the "C" classification, although the larger volume of recession occurred in the "A" division, the National Machine Tool Builders' association, Cincinnati, reports. Shipments varied little in aggregate of groups. Unfilled orders continue to run approximately two and a half times current shipments. Figures of actual orders follow:

| 1930 | *Index A | *Index B | *Index C | Total |
|---|---|---|---|---|
| April | 171.4 | 199.5 | 200.3 | 179.1 |
| May | 119.5 | 182.5 | 145.6 | 135.1 |
| June | 121.8 | 132.7 | 162.2 | 125.8 |
| July | 78.4 | 124.4 | 132.9 | 91.1 |
| Aug. | 102.4 | 153.9 | 119.1 | 113.8 |
| Sept. | 129.7 | 138.8 | 215.9 | 135.9 |
| Oct. | 81.3 | 112.3 | 118.1 | 90.1 |
| Nov. | 56.0 | 67.8 | 96.6 | 60.4 |
| Dec. | 58.4 | 92.7 | 126.6 | 68.8 |
| (Yr. av.) | 119.8 | 146.4 | 164.7 | 127.8 |
| 1931 | | | | |
| Jan. | 64.6 | 75.1 | 68.6 | 66.9 |
| Feb. | 68.3 | 129.8 | 93.1 | 83.7 |
| March | 109.2 | 133.4 | 180.9 | 117.6 |
| April | 97.7 | 103.3 | 95.0 | 105.1 |

*Note—Index A, base over $50,000; Index B, bases $10,000 to $50,000; Index C, base less than $10,000. Base: average shipments for years 1922-23-24. Totals: The total of all reports is not an average of A, B and C, but the sum of each item in percentage of the total base.

## Enameled Ware Shipments Up for Fourth Month

Enameled sheet metal ware total shipments rose in March for the fourth successive month, increases being shown in white and gray classifications, colored remaining static. Department of commerce monthly compilation follows:

**In Dozens**

| | Total | White | Gray and Colored |
|---|---|---|---|
| 1930 | | | |
| March | 341,372 | 124,856 | 216,516 |
| 3 mos. | 1,005,433 | 356,137 | 649,296 |
| April | 318,431 | 124,562 | 193,869 |
| May | 290,617 | 114,709 | 175,908 |
| June | 247,861 | 90,151 | 157,710 |
| July | 213,420 | 70,718 | 142,702 |
| Aug. | 309,645 | 89,259 | 220,386 |
| Sept. | 297,622 | 97,262 | 200,360 |
| Oct. | 329,337 | 107,553 | 221,784 |
| Nov. | 263,365 | 79,719 | 183,646 |
| Dec. | 250,568 | 70,554 | 180,014 |
| (Year) | 3,526,299 | 1,200,624 | 2,325,675 |
| 1931 | | | |
| Jan. | 267,232 | 84,917 | 182,315 |
| Feb. | 289,205 | 96,812 | 192,393 |
| March | 312,916 | 103,375 | 209,541 |
| 3 mos. | 869,353 | 285,104 | 584,249 |

## Galvanized Ware Output Booms in March

Production of galvanized pails and tubs in March was the highest since May, 1929, according to department of commerce. Other ware output was off from February's total. Three-month totals for 1931 are under the corresponding 1930 figures, however. Following are comparisons:

**In Dozens**

| | Pails and Tubs Production | Pails and Tubs Shipments | Other Ware Production |
|---|---|---|---|
| 1930 | | | |
| March | 135,178 | 135,602 | 37,963 |
| 3 mos. | 400,505 | 420,186 | 107,066 |
| April | 131,015 | 120,552 | 44,058 |
| May | 113,645 | 107,496 | 44,405 |
| June | 89,982 | 82,956 | 40,646 |
| July | 91,879 | 104,096 | 42,056 |
| Aug. | 103,050 | 103,354 | 46,730 |
| Sept. | 103,177 | 116,875 | 38,218 |
| Oct. | 130,906 | 115,185 | 40,084 |
| Nov. | 60,798 | 68,330 | 16,061 |
| Dec. | 87,140 | 68,898 | 21,657 |
| (Year) | 1,309,097 | 1,307,928 | 440,981 |
| 1931 | | | |
| Jan. | 103,677 | 133,977 | 23,716 |
| Feb. | 132,781 | 120,723 | 34,347 |
| March | 146,438 | 144,637 | 31,542 |
| 3 mos. | 382,896 | 399,337 | 89,605 |

## Steel Shelving Orders Best Since November

Steel furniture orders in March at $1,518,435 value were improved over the February, but not up to January's mark. Shipments fall into the same category. However, new orders for steel shelving were the best since November, 1930, according to department of commerce figures:

**(In Dollars, 000 omitted)**

| | Business Group New orders | Business Group Shipments | Shelving New orders | Shelving Shipments |
|---|---|---|---|---|
| 1930 | | | | |
| March | 2,627 | 2,726 | 839 | 812 |
| (3 mos.) | 7,884 | 8,167 | 2,323 | 2,170 |
| April | 2,523 | 2,427 | 796 | 814 |
| May | 2,310 | 2,342 | 725 | 751 |
| June | 2,006 | 2,168 | 699 | 705 |
| July | 1,840 | 1,811 | 596 | 604 |
| Aug. | 1,788 | 1,985 | 526 | 555 |
| Sept. | 1,795 | 1,879 | 512 | 497 |
| Oct. | 1,855 | 1,901 | 534 | 593 |
| Nov. | 1,637 | 1,673 | 429 | 458 |
| Dec. | 1,565 | 1,800 | 242 | 468 |
| (Year) | 25,204 | 26,154 | 7,382 | 7,615 |
| 1931 | | | | |
| Jan. | 1,798 | 1,797 | 376 | 393 |
| Feb.* | 1,509 | 1,598 | 375 | 356 |
| March | 1,518 | 1,588 | 416 | 436 |
| (3 mos.) | 4,826 | 4,984 | 1,166 | 1,185 |

*Revised.

## Electrical Goods Show Fourth Quarterly Drop

New orders for electrical goods booked during the first quarter of 1931 totaled $181,265,102, compared with $208,935,443 for the fourth quarter of 1930. The following total, by the department of commerce from reports of 84 manufacturers, includes motors, storage batteries, domestic appliances and industrial equipment:

| Quarters | 1931 | 1930 |
|---|---|---|
| 1st | $181,265,102 | $314,329,372 |
| 2nd | ..... | 292,902,071 |
| 3rd | ..... | 228,732,926 |
| 4th | ..... | 208,935,443 |
| Total | ..... | $1,044,899,812 |

## Truck, Tractor Shipments Decline in April

Shipment of electrical trucks and tractors in April declined from March's high for 1931. A total of 71 units was shipped by 10 leading manufacturers reporting to the department of commerce. As the following shows, this compares with 106 units in April, 1930:

| 1930 | Total | Shipment—Domestic | Shipment—Export |
|---|---|---|---|
| April | 106 | 101 | 5 |
| (4 mos.) | 498 | 455 | 43 |
| May | 144 | 125 | 19 |
| June | 95 | 63 | 32 |
| July | 108 | 99 | 9 |
| August | 92 | 81 | 11 |
| September | 81 | 75 | 6 |
| October | 93 | 90 | 3 |
| November | 45 | 36 | 9 |
| December | 51 | 42 | 9 |
| (Year) | 1,191 | 1,050 | 141 |
| 1931 | | | |
| January | 38 | 33 | 5 |
| February | 56 | 50 | 6 |
| March | 93 | 84 | 9 |
| April | 71 | 48 | 23 |
| (4 mos.) | 258 | 215 | 43 |

## April Locomotive Shipments Up; Orders Are Off

With unfilled orders for locomotives at 80, down 15 units from March, shipments for April showed a gain to 15 locomotives, according to the principal manufacturers' report to the department of commerce. Following statistics do not include data on locomotives produced by railroads in their own shops:

| | Shipments Domestic | Shipments Foreign | Unfilled Orders Domestic | Unfilled Orders Foreign |
|---|---|---|---|---|
| 1930 | | | | |
| April | 94 | 3 | 462 | 7 |
| 4 mo. | 273 | 11 | ..... | ..... |
| May | 56 | 2 | 411 | 9 |
| June | 80 | 1 | 335 | 8 |
| July | 55 | 1 | 284 | 7 |
| Aug. | 73 | 4 | 229 | 5 |
| Sept. | 65 | ..... | 169 | 5 |
| Oct. | 50 | ..... | 127 | 5 |
| Nov. | 43 | ..... | 88 | 5 |
| Dec. | 44 | 5 | 104 | ..... |
| (Year) | 739 | 24 | ..... | ..... |
| 1931 | | | | |
| Jan. | 16 | ..... | 90 | 1 |
| Feb. | 15 | ..... | 92 | 11 |
| March | 10 | ..... | 83 | 12 |
| April | 14 | 1 | 69 | 11 |
| 4 mo. | 55 | 1 | ..... | ..... |

Josam Products Foundry Co., Michigan City, Ind., has filed papers with the secretary of state in Indianapolis showing a reduction in directors from five to three.

# Industrial Men in the Day's News

## S. M. Kintner, Vice President in Charge of Engineering, Westinghouse Electric & Mfg. Co.

FOLLOWING graduation he spent about nine years in academic and professorial work at the Western University of Pennsylvania, now University of Pittsburgh.

FROM 1903 to 1911 he was identified with Westinghouse company's research and railway motor design departments.

RISING to the presidency of National Signalling Co., he sold it to Westinghouse in 1920, which he then rejoined.

EXCEPT for about nine years, 1911 to 1920, S. M. Kintner has spent his entire business life with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., of which he recently was made vice president in charge of engineering, as noted in STEEL of May 7. He succeeded W. S. Rugg, who was elected vice president in charge of sales. For some time previously Mr. Kintner had been assistant vice president in charge of engineering. Before he entered industry he spent another 9-year period in university work at Pittsburgh.

In 1894 Mr. Kintner was graduated in electrical engineering from Purdue university. He spent a year in telephone construction and operation and then became assistant to Prof. R. A. Fessenden at the Western University of Pennsylvania, now the University of Pittsburgh, where he remained for two and a half years. He then was made assistant professor of mathematics and later professor of engineering in succession to Professor Fessenden, with whom he had worked on investigations in connection with Hertz waves, X-rays and other phenomena which came into prominence at that time. He remained professor of engineering at the university for three years, resigning in the summer of 1903 to enter the research department of the Westinghouse company.

After four years of study in connection with high tension phenomena, alternating curent electrolysis, telephone interference, motor flashing difficulties, etc., he was made design engineer in charge of alternating current railway motor design. He designed the motors purchased for the New Haven railway, St. Clair tunnel and numerous other installations.

Resigning from the Westinghouse company in 1911, he became general manager of National Signalling Co., which developed radio inventions. Later he became its vice president and finally president. During the World war this company made considerable radio apparatus for the United States navy and signal corps. After the armistice Mr. Kintner negotiated the sale of his organization to the Westinghouse company which he then rejoined, entering its radio department in 1920. After two years he was appointed manager of the research department and April 16, 1930, was elected assistant vice president in charge of the company's engineering activities.

Mr. Kintner is a member of the American Institute of Electrical Engineers, American Physical society, Engineers Society of Western Pennsylvania, Institute of Radio Engineers, National Research council, Franklin institute, and the Edgewood Country club. June 11, last year, the University of Pittsburgh conferred on him the honorary degree of doctor of science.

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ALBERT L. CROMLISH, recently general superintendent at the Farrell, Pa., plant of Carnegie Steel Co., Pittsburgh, became on May 15 general superintendent of the Duquesne plant, to succeed Samuel G. Worton, resigned. Born in Wilkinsburg, Pa., Mr. Cromlish prepared for college at East Liberty academy, later attending Pennsylvania State college, where he received a B. S. degree. His first employment was as chairman of an engineering corps with the Bessemer & Lake Erie railroad, during vacations in 1895 and 1896. In 1897 he became chemist for Shenango Valley Steel Co., New Castle, Pa. After two years he became chemist for Carnegie company at Niles, O., furnace, later going to the New Castle works as chief chemist. In 1904 he was made assistant superintendent of Farrell, Pa., blast furnaces of the Carnegie company, and in 1908 he was made superintendent of Donora, Pa., blast furnaces, Neville furnace, Neville Island, near Pittsburgh, Edith furnace, Pittsburgh, and furnaces at Farrell. Mr. Cromlish was made general superintendent at Farrell in 1920.

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C. H. Butts has been appointed vice president in charge of operations for Newton Steel Co., Youngstown, O., to succeed C. B. Pollock, resigned.

R. L. Ritzie, manager of the company's Newton Falls, O., plant, becomes general manager of the Monroe, Mich., and Newton Falls plants. At

Monroe he succeeds R. M. Laning, who resigned after being identified with the company since 1928, when he became general superintendent at Newton Falls, later going to Monroe.

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William O. Munroe has been appointed works manager of Baldwin Locomotive Works, Philadelphia.

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H. G. Tallerday, formerly vice president has been elected president of Western Pipe & Steel Co., San Francisco, to succeed James A. Talbot, resigned.

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C. L. Ferguson has resigned as superintendent of Falcon Works, Niles, O., of Empire Steel Corp., Mansfield, O., to assume similar duties with Mahoning Valley Steel Co., Niles, O., succeeding Harry C. Davis, who resigned effective May 31. He has been superintendent since April, 1922.

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Ernest L. Watson has resigned as president and general manager of American Furnace & Foundry Co., Monroe, Mich., positions he has held since the company was organized in 1920. He also resigned similar positions with American Boiler & Foundry Co., an associate interest organized in 1924. He remains as director of both companies. His successor has not been named.

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R. F. Mehl, superintendent of the division of physical metallurgy of the naval research laboratory, Washington, since September, 1927, and one of the research consultants of the American Rolling Mill Co., Middletown, O., for the past 18 months, has been appointed assistant director of research of the American company, effective Sept. 1, 1931. He will be in charge of the physical science department of the Armco laboratories.

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Otto Lutherer, who for four and one-half years has been research engineer at the laboratory of the American Gas association, has been appointed chief engineer in the gas and oil combustion equipment division of the North American Mfg. Co., Cleveland, turbo blowers, etc. Mr. Lutherer is an engineer graduate of the University of Berlin and for about a year was identified with the laboratories of the bureau of standards at Washington.

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Guy P. Shambo, with Illinois Steel Co., Chicago, since 1917, has been appointed merchant mill superintendent at its Joliet, Ill., works, to succeed George Palmer, who retired May 1. Mr. Shambo has been mechanical foreman of the merchant mill, in which capacity he was succeeded by Robert D. Bell, with the company since 1922.

Michael Keough, who has been foreman of the boiler shops at the coke plant, succeeds J. W. Dunn, foreman of the boiler shops at the merchant mill, who also retired. Mr Keough has been with the company since Oct. 26, 1903. His successor is Bernard Sheridan.

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Burrows Sloan was elected chairman of the board of General Refractories Co., Philadelphia, at a recent meeting of the directors.

John R. Sproul was elected presi-

(*Concluded on Page* 82)

# Obituaries

E. A. S. CLARKE, 69, long a prominent figure in the iron and steel industry and for nine years secretary of the American Iron and Steel institute, New York, was buried May 18 at Rumson, N. J., where he had his home. He died May 15 of pneumonia.

He was born in Ottawa, Ont., Jan.

E. A. S. Clarke

21, 1862, and was graduated from Harvard university as bachelor of arts in 1884. That year he entered the laboratory of the Spang Steel & Iron Co., Sharpsburg, Pa. The following year he became affiliated with the Union Steel Co., Chicago, and five years later, in 1890, became assistant superintendent of the Union works of the Illinois Steel Co., Chicago. A year later he was appointed assistant general superintendent at South Works and in 1899 general manager of the Illinois Steel Co. He resigned late that year and went abroad.

Upon his return Mr. Clarke became general manager of manufacturing of the Deering Harvester Co., Chicago, and Oct. 1, 1903, was appointed to the same position for the International Harvester Co., Chicago. Late the following year he resigned to become president of the Lackawanna Steel Co., with offices in New York. Then in 1919 he resigned to become president of the Consolidated Steel Co. an export organization formed by various independent steel companies to operate under the Webb act. This organization was later dissolved, due largely to the merging of some of its members and to the industrial depression. He then became secretary of the American Iron and Steel institute.

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Charles S. Hebard, president of International Boiler Works Co., East Stroudsburg, Pa., died May 5.

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C. Thrower Clack, manager of the foreign offices of Blaw-Knox Co., Blawnox, Pa., died May 17, in Dusseldorf, Germany. He was president of Milliken Bros. when that company was merged with the Blaw-Knox organization.

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J. George Lehman, 57, president and general manager of the Bethlehem Foundry & Machine Co., Bethlehem, Pa., died May 14. He was a member of the Engineers' Club of New York. He was graduated from Lehigh university in 1896.

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Herbert M. Kipp, 59, department manager in the steel mill of the Ford Motor Co., Detroit, died recently. Born in Canada, he located in the United States at the age of 17. He had been with the Ford Motor Co. for 18 years.

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William A. Long, 60, who has been identified with Pratt & Whitney Co., Hartford, Conn., since 1925, died May 3 at Providence, R. I. Mr. Long specialized in the cutting and finishing of gears for the past 35 years or more and in that interval had been identified with Brown & Sharpe Mfg. Co., Barber-Colman Co., Pierce-Arrow Motor Co., and Franklin Motor Car Co.

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Arthur James, Moxham, 76, once associated with the Johnson Co., Johnstown, Pa., making girder rails, frogs and switches, died May 16, in Great Neck, Long Island, N. Y. The Johnson company later became Lorain Steel Co., which in 1901 became a part of the United States Steel Corp. Later with H. M. Whitney, of Boston, Mr. Moxham organized Dominion Iron & Steel Co.

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Charles Day, chairman of Day & Zimmermann Inc., Philadelphia, engineer, died May 10. After gradu-

(*Concluded on Page* 97)

# Here and There in Industry

BALDWIN LOCOMOTIVE WORKS, Philadelphia, George H. Houston president, has bought the subsidiary companies of Cramp-Morris Industrials Inc., including I. P. Morris & De La Vergne Inc., Philadelphia; De La Vergne Engine Co., Philadelphia; Cramp Brass & Iron Foundries Co., Philadelphia; Federal Steel Foundry Co., Chester, Pa.; and Pelton Water Wheel Co., San Francisco. These companies formerly were subsidiaries or nonmarine departments of the William Cramp & Sons Ship & Engine Building Co., which were segregated in 1926 when the latter company ceased shipbuilding activities. Production and research and experimental programs will be continued by the new owner.

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W. W. Jourdan & Co. Inc., power plant engineer, has removed its New York office to room 1935 at 25 Broadway.

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Luria Bros. & Co., dealers in iron and steel scrap, have taken new offices in Pittsburgh at 1946-48 Oliver building.

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Continental Roll & Steel Foundry Co. has moved its Pittsburgh offices from the Union Bank building to suite 2105 Grant building.

□ □ □

Yale & Towne Mfg. Co., Stuebing division, Cincinnati, will move its platform department from Cincinnati to Philadelphia at the end of May.

□ □ □

M. A. Hanna Co., Cleveland, has occupied new offices on the eighth floor of the Broad Street Station building, Pennsylvania boulevard and the Parkway, Philadelphia.

□ □ □

Edgewater Steel Co., Pittsburgh, has appointed A. J. Couse district manager in the Chicago territory. The office as heretofore is at 1329 Peoples Gas building.

□ □ □

Pacific Car & Foundry Co., Seattle, which recently bought the equipment of the Bacon & Matheson Drop Forge Co., has taken over the Arrow Pump Co., Seattle, and will continue its business at the Renton plant.

□ □ □

National Can Co., Boston, is celebrating its thirtieth anniversary this month and as part of the observance has established a district office in the Chrysler building in New York in charge of Eugene M. Pletcher, who has been closely connected with the can business since 1905. David Stern, treasurer and general manager, will co-operate in building up this office.

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Bethlehem Steel Co., Bethlehem, Pa., has placed a contract with H. A. Brassert & Co., Chicago, for a set of the latter's patented insulated blowpipes for its No. 6 blast furnace at Johnstown, Pa.

□ □ □

Dardelet Threadlock Corp., New York, has licensed the Colorado Fuel & Iron Co., Pueblo, Colo., for the manufacture and sale of track and commercial bolts and nuts formed with its self-locking threads.

□ □ □

Wheatland Tube Co., Edward F. Maneely, Philadelphia, president, manufacturer of wrought iron pipe, will start operations shortly in a new plant at Wheatland, Pa. Benjamin A. Small is general plant manager.

□ □ □

Acme Chair Co., Reading, Mich., has bought the equipment, dies and patents of the Beacon Steel Furniture Co., Chicago, manufacturer of steel folding chairs and tables. Operations will be removed to Reading and added to the plant of the purchaser.

□ □ □

Graver Tank & Mfg. Corp., East Chicago, Ind., manufacturer of water treating equipment, tanks and special plate construction, has appointed W. B. Conner Co., Chrysler building, New York, its eastern representative.

□ □ □

C. E. Naylor, manufacturers' agent, specializing in railroad and refinery supplies, Esperson building, Houston, Tex., has removed his office to 1400 Conti street, in connection with the office of the Maintenance Engineering Corp.

□ □ □

Victor Talking Machine Co. of Canada has practically completed reconstruction of its plant at Toronto, Ont., at a cost of about $500,000. Modern equipment has been installed for production of radio equipment of all-Canadian manufacture.

□ □ □

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., has opened a branch sales office at 2832 East Grand boulevard, Detroit, where direct factory representation will succeed jobbing representation. The full line of indicating, recording and controlling instruments will be carried. H. W. Kerr will be in charge.

□ □ □

Malleable Iron Range Co., Beaver Dam, Wis., May 6 completed 365 days without a lost-time accident, the company's general safety committee has announced. This record safety year included 855,200 work hours. The best previous record was 237 days with 639,800 hours, in 1928.

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Ferro Enamel Corp., Cleveland, has contracted with the Youngstown Pressed Steel Co., Warren, O., to supervise installation of equipment for production of porcelain tile for the Porcelain Tile Co., Chicago. The equipment is largely automatic and of the most advanced design.

□ □ □

Globe Steel Tubes Co., Milwaukee, is making plant improvements costing about $100,000, according to Frank J. O'Brien, president. A small addition is being made to the rolling mill and improvements and replacements are being made in the equipment. The plant is running about 50 per cent of capacity, as for some time past.

□ □ □

Fuller & Johnson Mfg. Co., Madison, Wis., maker of gasoline engines for industrial and farm purposes, has sold its assets to the Lay & Winslow Co., Detroit, for $75,000, of which $68,000 is for the equipment and $7000 for account receivable. Lease of the factory buildings is included. The new owners expect to continue it as a going concern.

□ □ □

Korfund Co. Inc., Long Island City, N. Y., manufacturer of cork plates and other isolation products, has occupied its new plant in Thirty-second place, removing from Forty-second street, New York. Additional manufacturing space and larger office quarters are available. New machinery and advanced processes of manufacture have been planned for the new factory. Engineering department and experimental laboratory will be enlarged and service facilities to architects and engineers increased.

□ □ □

Allis-Chalmers Mfg. Co., Milwaukee, is engaged in negotiations for acquisition of the electrical divisions of the American Brown Boveri Co., New York. Consummation of the deal will give the purchasers a number of new products, including mercury arc rectifiers, electric furnaces, switch and traction equipment, blowers and compressors. A tentative contract has been made with the Brown Boveri Co. of Switzerland for exclusive use of patents and developments relating to these lines. Properties to be acquired include Condit Electrical Mfg. Co., Boston, and the electrical business of the American Brown Boveri Co. in Camden, N. J. The purchase is to be principally in stock of the Allis-Chalmers company.

# MIRRORS of MOTORDOM

*DETROIT*

AUTOMOBILE production declined last week—only 1½ per cent, but possibly indicating a trend. Truck output was strong and unchanged, but decreases outnumbered increases among passenger car manufacturers, and apparently May production of some medium-size companies will be on the under rather than the over side of their schedules.

This slight retrenchment evidences the sensitive attunement of production to sales. With dealers' stocks light, factory schedules are not anticipating retail deliveries by more than a month. Indeed, at least one manufacturer formulates his week's schedule Monday morning following a telegraphic accumulation of actual orders from his distributors.

By mid-June spring retail demand normally is past its peak, and with the general business situation falling short of expectation, the first signs of a tendency to retard production became evident last week. Unless this tendency is reversed, May output will do no better than fall within the 330,000 to 350,000 units estimated for April, and April indeed may prove the top of the spring bulge.

## Chevrolet a Fender Ahead

Chevrolet has not increased its schedule for three weeks, contrary to some expectations, while Ford has evened up by remaining fairly constant just under the Chevrolet weekly rate. Slight declines are now evident among Buick, Cadillac-LaSalle, Chrysler, DeSoto, Hudson-Essex, Hupp, Packard, Plymouth and Pierce-Arrow, while increases have been recorded by Auburn-Cord, Graham, Devaux-Hall and Reo. Others are unchanged.

Chevrolet continues to lead production with a daily rate of about 4500 units, 5 days a week. Its weekly total has been running between 23,000 and 25,000 units, with a general expectation that May assemblies will now approach 120,000 units. Except for the introduction of syncro-mesh transmission, shortly, the present line will run through 1931. The Chevrolet bumper division in Detroit now is in production.

## Ford Is Buying Closely

Ford is steady at about 7200 units a day, 3 days a week, giving it a weekly total of about 21,500 or several thousand below Chevrolet. Material suppliers are no longer permitted to anticipate Ford requirements, and receipts of material and parts for Model A are shrinking. The tool and die department is operating day and night, while the foundry at Fordson recently made a test run on new motors. An inquiry for billets has been issued at Fordson, although the inventory of billets and bars there is large.

Buick this week reduced its work week from 5 days to 4 days, but holds its daily rate unchanged at approximately 550 units. Normally Buick would be tapering off for a model change, but the decision to run through 1931 with the present series will make it a factor for strengthening production totals for the next 90 days.

Chrysler as a whole shows declines. On a weekly basis the output of Chrysler models proper has been reduced from 2500 units to 2000, of De Soto from 1400 to about 1000, and of Plymouth from 900 to 800. Dodge holds steady at 3000 a week. Chrysler having announced its new eights, it now has before it a new Plymouth, due in about a month. Among other innovations, Plymouth is expected to be the first Chrysler line with free-wheeling.

Hudson-Essex, which is offering free-wheeling at a slight additional charge, has reduced its weekly output from 2100 to 1850. Packard, approaching a model change, is down from 400 to 300 weekly.

Hupp, operating 5 days a week at both Detroit and Cleveland, has cut its weekly output from 750 units to 550. New Hupp sixes and eights are reported due soon, featuring a radiator of the V-type and an extreme slanting windshield. A Detroit body plant which normally would have built the new Hupp bodies could not take the business because it is already producing much the same type for another car manufacturer.

Reo, which will bring out a new low-priced eight as well as a six, has slightly increased its rate from 60 units to 75, 5 days. A further increase in production by Reo is expected.

Oakland-Pontiac is going strong, averaging 650 units daily, 5 days. Its April production of 14,188 cars was the largest for any month since August, 1929.

Oldsmobile continues unchanged at 370 cars daily, 5 days. Graham, under the impetus of demand for its Prosperity Six, is assembling about 200 units of all models, 5 days.

The Cadillac V-12 is proving the best seller of this line, but is unable to neutralize declines in the other Cadillac and LaSalle models and the weekly output of this General Motors unit is off from 600 to 450.

## More Cylinders for Lincoln?

Lincoln, which is assembling about 120 units a week, is understood to be contemplating a price reduction and may invade the multi-cylinder field.

Auburn-Cord is making about 1675 units weekly, an increase of about 200. DeVaux-Hall, swinging into its new line, has increased from 800 weekly to 1000. On a weekly basis Nash is unchanged at about 1000 units, Studebaker at 1600, Franklin at 150, Durant at 200, Peerless at 75, Marmon at 175.

Willys-Overland, after reducing last week to 2000 units, has jumped back

to 3000, with a probable output of 9000 units this month.

Thus, last week's total production of passenger cars and trucks approximated 75,000 units, or about 1000 fewer than in the week preceding. On the basis of last week's rate, the May total will be slightly over 330,000. A year ago the weekly output was about 140,000 units and two years ago about 100,000. There is a good deal of opinion that production not having experienced a remarkable bulge in April and May, the decline into the summer will be less than normal.

## More Signs of Ford Change

Obviously, a change by Ford will not be officially heralded in advance from the housetops, but the indications of a disturbed routine at Fordson are more pronounced.

The tool and die departments have been operating 24 hours a day, 7 days a week—a pace not wholly explained by Russian business.

The foundry has made a test run of a new type of motor, presumably for experimental machining and ascertainment of costs.

Material for Model A still is being received, but in reduced volume and producers have been cautioned against anticipating requirements.

Branch assembly plants have been moderately-heavily stocked with parts for Model A.

To the rest of the world the contest between Ford and Chevrolet in the low-price field may be interesting competition, but to Detroit it is a vital economic matter. Despite the multiplicity of Ford branch assembly plants, Ford in a large sense is Detroit. Chevrolet production, on the other hand, is largely outside of Detroit.

Therefore, any fluctuation in Ford operations is closely watched, and no topic is so widely discussed today. Majority opinion still is that a revised four and a new eight are in prospect, and that while branch plants continue to turn out Model A from their stock of parts the changeover will be made in the Detroit plants. Reports of a lengthy shutdown, beginning June 1 or July 1, still persist.

The chief element of uncertainty in this program is Henry Ford himself. Edsel Ford is reputed to be the advocate of change; he favored jettisoning Model T months before the market situation compelled it. But Henry Ford is a disciple of forcing the run on a model to the limit.

## No Profit on Model A?

Incredible as it may appear, could it be possible that Model A has not been a financial success? Could any automobile manufacturer assemble 5,000,000 units and not make money?

Due to the one-family ownership of the Ford Motor Co., public knowledge of the company's finances are scanty and limited to the annual report to the Massachusetts commissioner of corporations and taxation, but certain generalizations may be made.

In March, 1927, old Model T was officially abandoned and Ford was out of production until December of that year, when the present Model A was introduced. The cost of retooling the Detroit and branch plants, plus the expense of development and loss of income was then variously estimated at $150,000,000 upward. Many estimates ran higher; $150,000,000 was the minimum.

In 1928 the Ford report to Massachusetts indicated a loss of $81,000,000. In 1929 there appeared to be a profit of $82,000,000, and in 1930 a profit of $45,000,000. The 5,000,000th Model A rolled off the assembly line in April, 1931, and prorating four months of 1931 on the basis of 1930—which would appear to be generous considering the general business situation—gives a credit of $10,000,000.

On this basis, the 5,000,000 Model A's have produced a total profit of $137,000,000, from which must be deducted the $81,000,000 loss of 1928, leaving a net profit of $56,000,000. In other words, it would appear that it cost $150,000,000 to change to Model A and the net profit since then has been only $56,000,000.

If the $150,000,000 changeover cost is disregarded and charged up to the profits of Model T, then a profit of $56,000,000 on 5,000,000 Model A's averages out only $11 per car—by no means an attractive margin.

• • •

Detroit, avid for enlargement of its steel industry, now expects a Chicago producer of strip to erect a mill in Ecorse on a tract not far from the Michigan Steel Corp. site. Business conditions may defer construction at least a year, it is said.

**(Mirrors of Motordom will appear again next week.)**

## Close Six Sales Offices But Remain in East

New York—Rogers Brown & Crocker Bros. Inc., selling pig iron, ferroalloys, by-product coke and kindred products, are concentrating their organization in three eastern offices, at New York, Philadelphia and Boston. They have closed their office at Pittsburgh, and will close those at Chicago, Cleveland, Cincinnati, St. Louis and Buffalo, effective May 31.

# Sheet Executive Sees Gains; Bright Spots in Business News of Week

INDICATIONS of improvement in business will probably be reflected in the present quarter," believes C. R. Hook, president and general manager, American Rolling Mill Co., Middletown, O.

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Shipments of the Midland Steel Products Co., Cleveland, in April increased 10 per cent over March. Prospects are May will hold this gain, reversing the usual May trend.

□ □ □

Orders of the Morse Chain Co., Ithaca, N. Y., a division of the Borg-Warner Corp., Chicago, on May 1 were 19 per cent greater than on April 1.

□ □ □

Deere & Co., Moline, Ill., will resume operations at the John Deere Mfg. Co. Ltd., Welland, Ont., late in the summer, this being the first announcement of resumption in any of the farm equipment plants.

□ □ □

April sales of the National Standard Co., Niles, Mich., manufacturer of automobile accessories and tire equipment, were the largest since May, 1929, and this month's output will equal April.

□ □ □

Western railroads report a favorable prospect for crop transportation. The Rock Island, for example, expects to handle 9000 more carloads of grain out of the Panhandle of Texas and eastern New Mexico than a year ago.

□ □ □

"Business statistics do not show much change for the better, nevertheless here and there some corporation is holding its own and showing real increase over the comparative period a year ago."—Market review of J. S. Bache & Co., New York.

□ □ □

Officials of LaVelle Foundry Co., 1740 West Michigan street, Indianapolis, have announced reopening of the plant after a suspension of nearly two years. Receipt of orders caused the officials to decide to move the equipment from another plant at Anderson to Indianapolis and accept the orders. Officials say they have every reason to believe there will be a gradual increase in the foundry business. T. A. LaVelle is president.

# EDITORIAL

## How Steelmakers Can Add To 1931 Profits

EFFICIENCY in production always has been a prime factor in steelmaking but its importance was never greater than it is today. Diminished demand and low prices make it necessary for steel producers to seek every possible means of introducing economies in production methods. Inasmuch as 85 per cent of the annual tonnage of ingots is made in open-hearth furnaces, a large share of the responsibility for efficiency falls upon the shoulders of the open-hearth superintendents.

That they are meeting the challenge with courage and intelligence is demonstrated by numerous important papers, reports and discussions presented before current meetings of steelworks operating officials. Last week more than 160 individuals interested in open-hearth practice met in Chicago under the auspices of the American Institute of Mining and Metallurgical Engineers to compare notes on furnace efficiency. Two papers scheduled for the meeting of the American Iron and Steel institute on Friday of this week deal with problems which have a direct bearing on the cost of steelmaking.

### Improvements in Design of Open Hearths Have Yielded Large Savings

The present efforts to advance open-hearth practice are a continuation of work which began with the experiments of Siemens, the Martin brothers, Thomas and other pioneers. From the sixties of the ninteenth century down to the present time the steel industry has witnessed a succession of improvements, each of which has contributed to the present knowledge of open-hearth furnace operation.

Some of the most important studies of recent years have been revealed in papers presented at the meetings of the American Iron and Steel institute. A typical illustration of progress in furnace efficiency is found in a paper by C. L. Kinney Jr. and G. R. McDermott, Illinois Steel Co., presented at the fall meeting of the institute in 1922. The authors submitted logs of tests conducted of typical furnaces before and after certain improvements had been made. From this data it was shown that in 1912 a standard 100-ton open-hearth unit required 750 pounds of coal per ton of ingots. In 1914, after improvements in the checker work had been introduced, the coal consumption was found to be 684 pounds per ton of ingots. In 1922, following refinements in port and melting chamber design, the coal requirements were reduced to 596 pounds per ton of product. Here was a saving of 20 per cent in fuel consumption, brought about largely through changes in the design of furnace details!

While the problem of design still is being studied in many quarters, the interest of many open-hearth superintendents now is being focused on combustion. This fact was emphasized at the meeting last week in Chicago where automatic furnace control, mechanical draft, advantages of various fuels and the merits of luminous and non-luminous flames vied with the design problems for attention.

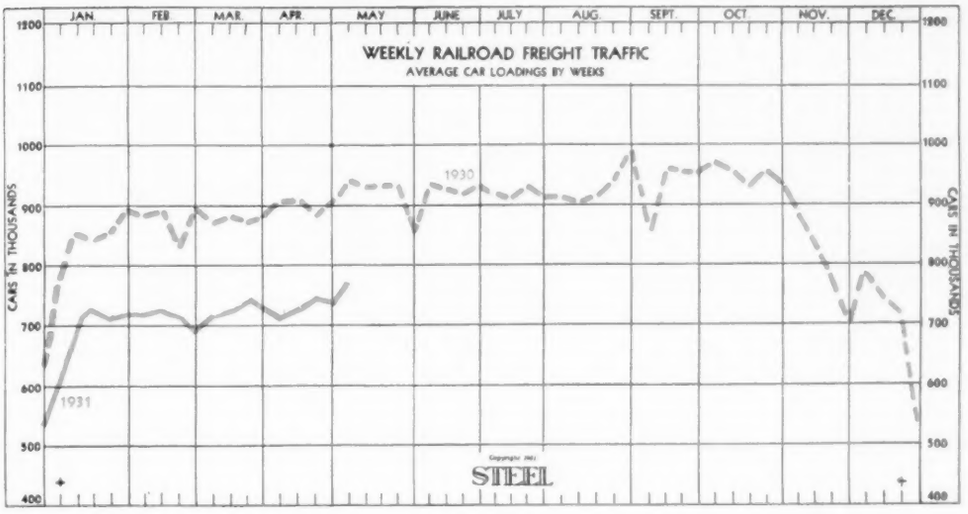
### Every Steelmaker Has Chance To Shave Few Cents Off Cost of Ingots

A number of claims made at this Chicago meeting are interesting when compared with the report of Messrs. Kinney and McDermott nine years ago. For instance, it was stated last week that mechanical draft on a 125-ton open-hearth furnace has resulted in a saving of 10 per cent in fuel consumption. The discussion also elicited testimony that installations of automatic furnace control have effected savings of from 25 to 30 cents per ton of ingots. Furnace insulation was declared responsible for savings of from 4 to 10 gallons of fuel oil per ton of ingots and for the greatly increased life of furnace roofs. One superintendent reported that by using heavy oil of 28 to 30 Baume instead of that registering 18 to 22 Baume he reduced the cost of ingots 40 cents per ton.

These instances of economy in open-hearth operation should offer encouragement to every steelworks superintendent. They indicate that there are numerous opportunities for increasing the efficiency of existing furnace equipment. It is safe to say that no operator—no matter how skillful he may be—has attained perfection in every one of the many details of open-hearth practice.

The importance of economical operation is easily demonstrated. For instance, assuming that improved practice throughout the industry would yield an average saving of 50 cents per ton of ingots, this would mean an annual reduction in costs of more than $17,500,000—based on the 1930 production. This is a substantial saving, and well worth striving for in this lean year of 1931!

# THE BUSINESS TREND




| 1930 | |
|---|---|
| May 2 | 942,674 |
| Apr. 25 | 906,879 |
| Apr. 18 | 892,706 |
| Apr. 11 | 911,316 |
| Apr. 4 | 908,059 |

| 1931 | |
|---|---|
| May 2 | 775,291 |
| Apr. 25 | 759,272 |
| Apr. 18 | 760,002 |
| Apr. 11 | 737,934 |
| Apr. 4 | 728,511 |

## Industry Is Responding To Seasonal Influences

BUSINESS has been side-slipping since late in March, but it has lost less altitude than is generally believed. Statistics for April indicate that losses from March have been less than anticipated. In fact the momentum of the first quarter carried a number of barometers to points slightly above March levels.

Because building awards declined discouragingly in the first part of April, it was expected that totals for the month would show a marked recession. However, the figures of the F. W. Dodge Corp. show that the area involved in awards in April was 3 per cent above that of the preceding month. The volume of residential construction held steady, but the amount of industrial construction gained sharply. Measured in terms of value, awards in April did not come up to totals for March, but there is a degree of satisfaction in the fact that the physical volume of building continued to expand in the fourth month.

### Increased Car Loadings Reflect Gains In Miscellaneous Freight

Freight traffic is holding up well. Car loadings in the week ending May 2 were 775,291, a gain of 16,019 cars. This was the best week of the year. Thus far in 1931 loadings have totaled 13,027,049 as against 15,829,933 in the corresponding period of 1930. While the recent gains in weekly loadings are no more than seasonal, there is ground for encouragement in the expanding volume of shipments of miscellaneous freight.

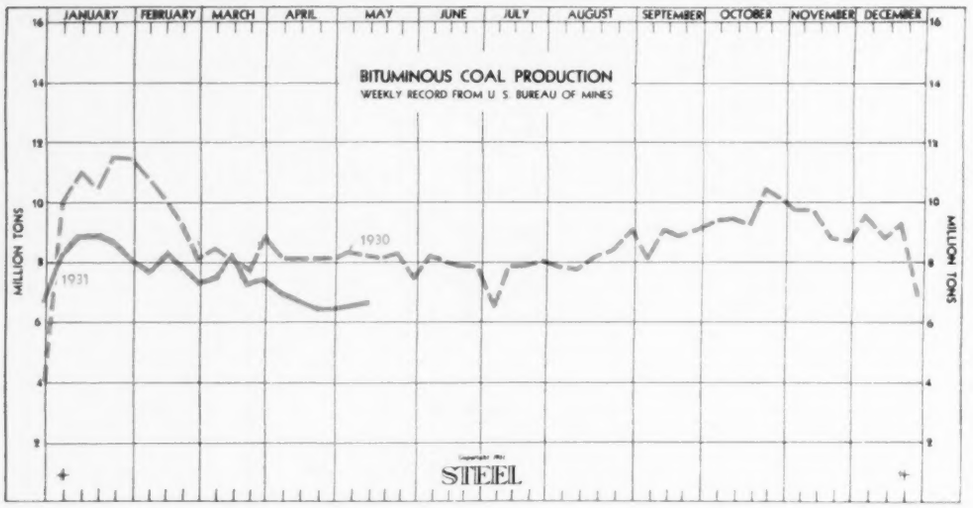
The department of labor reports a gain of .2 of a per cent in manufacturing employment in April, but a reduction in payroll totals of 1.5 per cent. This means that employment was maintained practically at March levels in spite of slightly reduced industrial activity in certain fields. The small loss in payrolls reflects wage cutting. Wage policies are undergoing a terrific test, and in the steel industry the prevailing attitude is to strive for economies in every possible direction before resorting to reductions in hourly rates. Adjustments in salaries are much more prevalent than reductions in wages.

### First Quarter Momentum Helps To Swell April Totals

Thanks to the momentum of the first quarter, the three months' moving average of machine tool orders compiled by the National Machine Tool Builders' association rose slightly in April. The single index for the month was down, indicating that the usual seasonal recession is in progress. The production of soft coal gained moderately early in May. Copper stocks increased, wiping out reductions of recent months.

Automobile output has continued to expand slightly, but there are signs of wavering. Experts declare that the wheat situation is somewhat better than at any time in months, due to improved strength in prices and indications of reduced acreage in certain production areas of the world. United States imports and exports of merchandise slumped to extremely low levels in April.

Money rates are the lowest in years. Commodity prices continue to sag. Irving Fisher's weekly index of wholesale prices of 200 commodities has declined for the seventh consecutive week. The index in the week ending May 8 was down 1.1 from the preceding week—a rather sharp recession. STEEL's composite of 14 prices of steel and iron products dropped again and stood at $31.37 on May 13, a reduction of 3 cents.




**Thousands of Tons**

| | 1931 | 1930 |
|---|---|---|
| May 9 | 6,708 | 8,285 |
| May 2 | 6,422 | 8,335 |
| April 25 | 6,314 | 8,191 |
| April 18 | 6,326 | 8,103 |
| April 11 | 6,784 | 8,257 |
| April 4 | 7,214 | 8,248 |

## Soft Coal Output Moves Slightly Upward In Recovery from April Curtailment

Further recovery from the slump which took place during April was made in the output of bituminous coal for the week ended May 9. Total production was 6,708,000 tons, an increase of 286,000 tons, or 4.5 per cent, over the preceding week. In the week ended May 2 a rise to 6,422,000 tons was made from the low point established in the final week of April. Total production of soft coal during the present calendar year to May 9 amounts to 140,713,000 net tons, compared with 170,988,000 tons in the corresponding period of 1930. During the early part of May a year ago, small declines were being registered in the daily average production figures.

## Continued Downward Tendency Brings Price Index to New Low Point

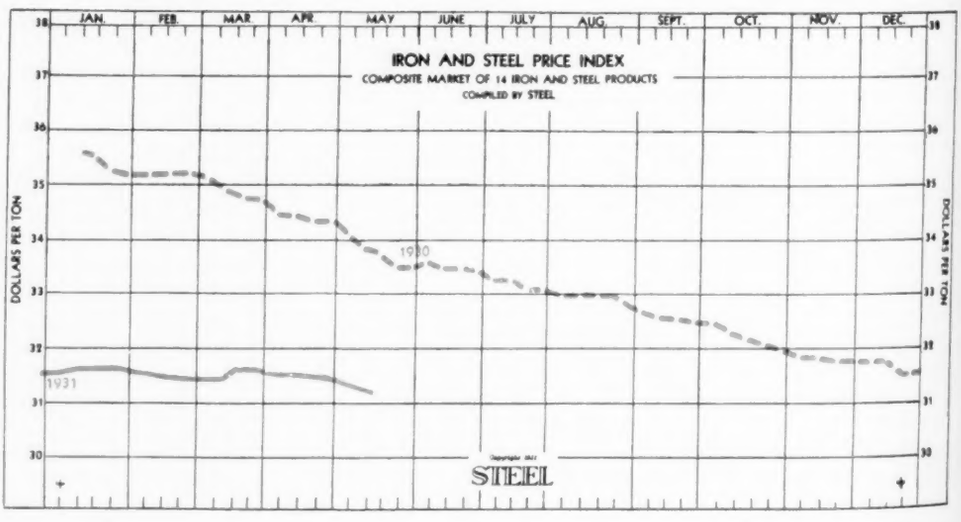
STEEL's iron and steel price composite dropped as of May 13 to $31.37, a new postwar low, from $31.40 on May 6. The most recent weaknesses have been in pig iron, with markets in eastern Pennsylvania and at Birmingham furnishing most of the cause for adjustments. Flat-rolled steel products also have been contributing to the steady decline of the price index. On April 8 the composite was unchanged at $31.67, but each week since that time downward revisions of varying degree have been necessary. The April monthly average, $31.59, off seven cents from the previous month, went to another new low to continue the decline which had been checked temporarily in March.

**Weekly Figures**

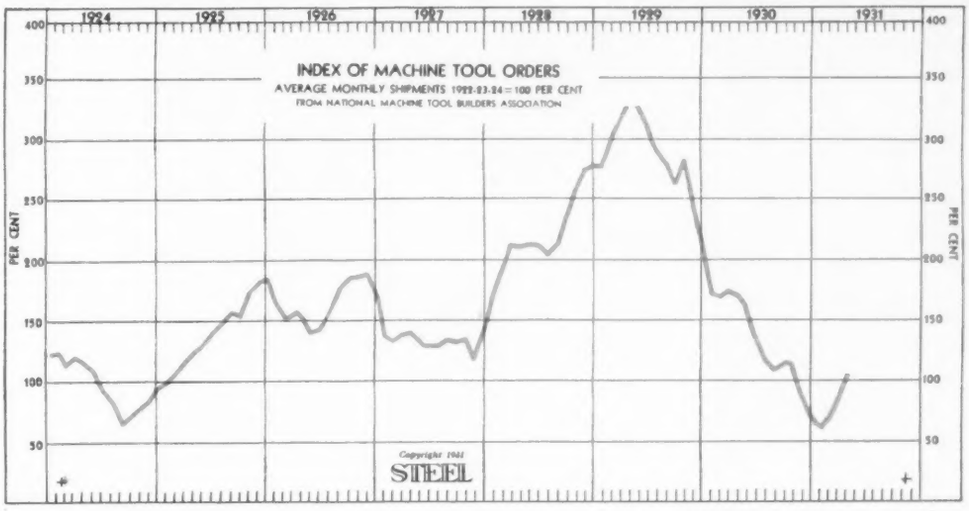
| | |
|---|---|
| May 13 | $31.37 |
| May 6 | 31.40 |
| April 29 | 31.49 |
| April 22 | 31.51 |
| April 15 | 31.59 |
| April 8 | 31.67 |

**Monthly Averages**

| | |
|---|---|
| April | $31.59 |
| March | 31.66 |
| Feb. | 31.65 |



| | 1931 | 1930 |
|---|---|---|
| April | 102.1 | 176.8 |
| March | 89.4 | 177.8 |
| February | 73.1 | 172.6 |
| January | 65.3 | 175.4 |
| | **1930** | **1929** |
| December | 73.1 | 222.1 |
| November | 95.5 | 247.2 |

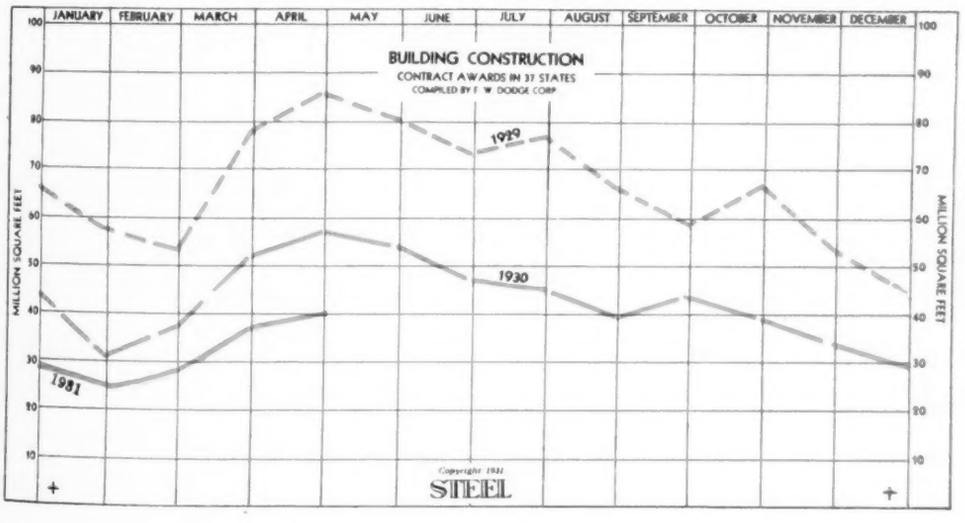



## Machine Tool Index Is Carried Higher By Momentum of First Quarter Gain

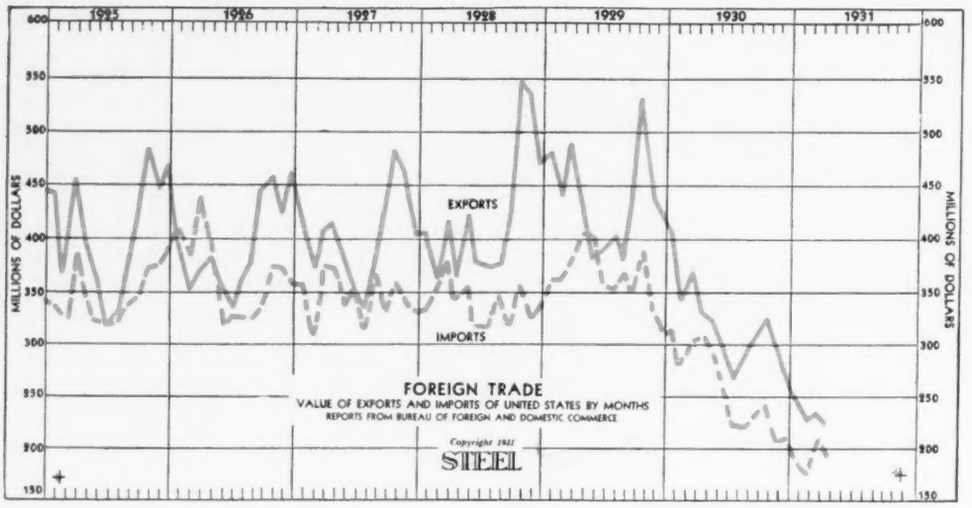
Actual machine tool orders for April followed the usual seasonal trend with a slightly downward movement, but the three months' moving average compiled by the National Machine Tool Builders' Association gained from 89.4 to 102.1 compared with a small contraction from 177.8 to 176.8 a year ago. For the single month the index declined from 117.6 to 105.1. The largest drop in volume of business took place in the class of larger companies, but the largest percentage drop was in the class of smaller companies, which the month before had shown the best gain. Shipments were practically unchanged and unfilled orders gained slightly, still being about two and one-half times shipments for the current month.

## April Witnesses Small Rise in Area Involved in Construction Projects

A further slight gain in building occurred in the month of April, in terms of the area involved in construction for which contracts were awarded, according to the report of the F. W. Dodge Corp. Value of the contracts decreased about 9 per cent to $336,925,200. Total contracts were for 39,380,300 square feet, a gain of about 3.7 per cent from 37,954,500 square feet for March. In April, 1930 a similar gain brought awards to 56,620,000 square feet. Residence construction advanced only from 22,089,500 to 22,632,700 square feet in April, but a larger gain was made in industrial construction, which totaled 2,463,500 square feet compared with 1,770,300 square feet in March, a gain of about 39 per cent.




| | Square Feet |
|---|---|
| April, 1931 | 39,380,300 |
| March, 1931 | 37,954,500 |
| April, 1930 | 56,620,000 |




**EXPORTS**

| | |
|---|---|
| April, 1931 | $217,000,000 |
| March, 1931 | 237,000,000 |
| April, 1930 | 331,843,000 |

**IMPORTS**

| | |
|---|---|
| April, 1931 | $187,000,000 |
| March, 1931 | 211,000,000 |
| April, 1930 | 307,927,000 |

## Exports and Imports of Merchandise Decline in April

Exports in April descended to a new low following their very weak March rise. A drop in the month of April is not an uncommon occurrence, however, as such a decline many times is a seasonal slackening from the regular March expansion. Shipments out of the country were valued at $217,000,000 and imports decreased to $187,000,000. The excess of exports over imports gained $4,000,000 to reach $30,000,000, compared with $23,916,000 a year ago. To May 1, total exports this year were $926,879,000 and the excess of exports $171,600,000 compared with $1,461,155,000 and $260,084,000 in 1930. In April a year ago, exports started a decline, while imports made a slight gain.

## Refined Copper Stocks Again Turn Upward as Shipments Drop

The April trend in refined copper was a complete reversal of that for the previous month, as stocks gained and shipments and production turned downward. A rise of 13,716 tons brought stocks to 367,921, nearly wiping out the reductions of the four preceding months. Production was down slightly to 100,501 tons and a marked descent to 86,785 tons took shipments below production. On the basis of a daily average, the apparent drop in production becomes a very small gain, from 3292 tons to 3350 tons. A year ago output was 4151 tons per day. Daily average shipments were down to 2893 tons from 3596 tons in March, but were above shipments of 2644 tons daily a year ago.

**Stocks**

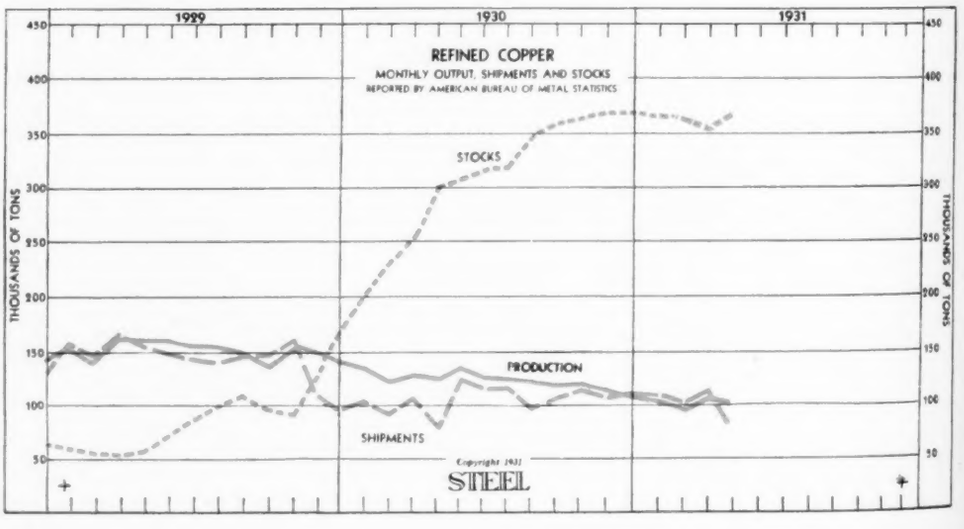
| | Tons |
|---|---|
| April, 1931 | 367,921 |
| March, 1931 | 354,205 |
| April, 1930 | 301,338 |

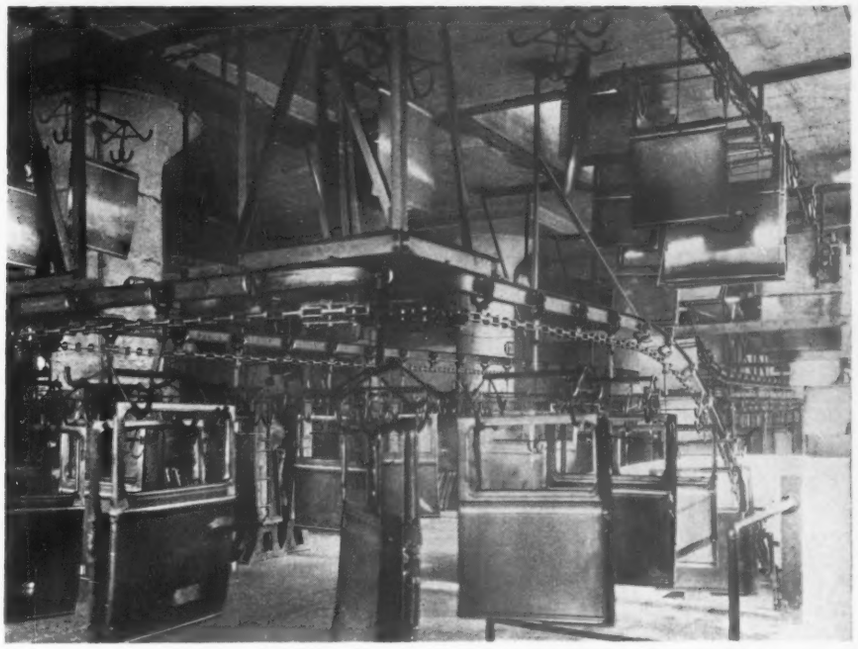
**Production**

| | |
|---|---|
| April, 1931 | 100,501 |
| March, 1931 | 102,058 |
| April, 1930 | 124,531 |

**Shipments**

| | |
|---|---|
| April, 1931 | 86,785 |
| March, 1931 | 111,482 |
| April, 1930 | 79,213 |





*All-steel doors are made in two parts, inner and outer panel, assembled by welding and pressing. An intricate system of monorail conveyors handles the parts from one operation to another*

# Monorail Conveyor System Reduces Production Costs

BY H. R. SIMONDS
Associate Editor, STEEL

DEVELOPMENT of a successful method of deep drawing steel sheets made possible steel doors for modern automobile bodies and more recently new methods of handling parts in process have helped to bring the production cost of these doors down to levels scarcely dreamed of 10 years ago. An example not only of low cost door production but of high efficiency in material handling methods is to be found at the Philadelphia door plant of Edward G. Budd Mfg. Co. In this one plant more than 2 miles of monorail conveyor is used in handling a production with a peak of 20,000 complete automobile doors a day.

The plant is a unit of a group in Philadelphia, which is linked with another group in Detroit, all devoted chiefly to the production of all-steel automobile bodies and body parts. For bodies, doors and other parts, automobile sheets are used and the extent of the combined operations is such that the company is one of the world's most important buyers of this steel.

The door plant is a self-contained unit receiving raw material at one end and shipping out at the other end complete doors and door parts. Raw material, principally automobile sheets, is ordered from the mills on a performance basis and without the usual detailed chemical and physical specifications. It was only through close co-operation between the sheet producer and the Budd company that sheets were developed with properties suitable to the unusual deep drawing and high finish requirements. For finish and uniform surface it was necessary to have a cold-rolled sheet, yet the best cold-rolled sheets available at the time the present process was started were not soft enough to take deep drawing without tearing. The final achievement of the present satisfactory material came as the result of a series of trials with combinations of annealing and cold rolling and the result is a partially annealed sheet with the surface characteristics of cold rolling.

Because it is important in any high production process to eliminate all possible operations the company was anxious to eliminate annealing from the manufacturing sequence and the steel mills, anxious to help create a large outlet for their product, took hold of the problem with no less enthusiasm than the

manufacturer. The result is the successful deep drawing and forming of parts for practically all designs of doors without annealing in process. In a few cases where the corners are taxed severely by the drawing, they are heated locally just before the press operation.

Sheets are received in open flat cars which enter the plant on a standard gage track. The receiving platform extends for several hundred feet along the side of this track and is served by overhead cranes equipped with special tongs as shown in an accompanying illustration.

The problem of handling the sheets both at the mill and at the manufacturing plant has been given considerable attention. It can be understood readily that it would be difficult to pick up part of a compact pile of sheets with tongs without marring the edges of some of the sheets. This difficulty is overcome by inserting at intervals in the pile spacers of sufficient width to permit entrance of the fingers. The unloading equipment at the plant is similar to the loading equipment at the mill, so that it is convenient at both ends to have the spacers at such places as to give the tongs a full working load. The piles of sheets in the open freight cars are protected adequately against weather with layers of waterproof cloth and paper.

In order to reduce the amount of scrap to a minimum the sizes of the sheets are specified to correspond with the sizes of the doors to be produced. In some cases it has been found advisable to buy sheets in sizes which are multiples of the desired size and then shear the sheets at the plant. Thus the first operation frequently is a shearing or trimming operation. The first blanking operation cuts the sheets to the approximate shape of the door and pierces holes known as draw holes which allow the flow of the material during the subsequent forming of openings in the piece.

In the second press operation the window openings are formed and in the third operation the main form of the door is produced, bringing the sheet to approximately its final shape, that is, with a curve in the lower part, a reveal round the entire edge and with a central beading or other design features.

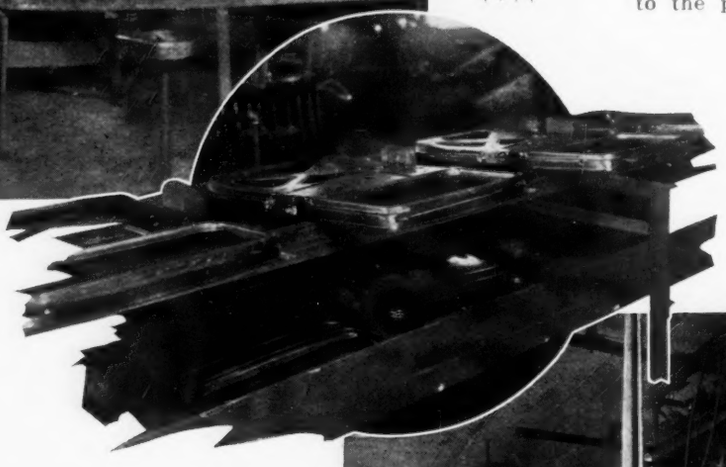
The next operation, known as trimming, cuts the edges of the window openings and the entire exterior edge of the door. A heavy press operation following this starts the turning of a deep reverse flange which is completed in the next operation by means of a complicated finger die. This last is a severe test as the material, already stretched at the edges, must be pressed further into an offset form.

The two sets of panels, outer and inner, each produced on a separate row of presses, are placed on conveyors which carry them to intermediate assembly stations where small parts such as hinges and locks are added and then on to the final assembly where the outer and inner panels are joined.

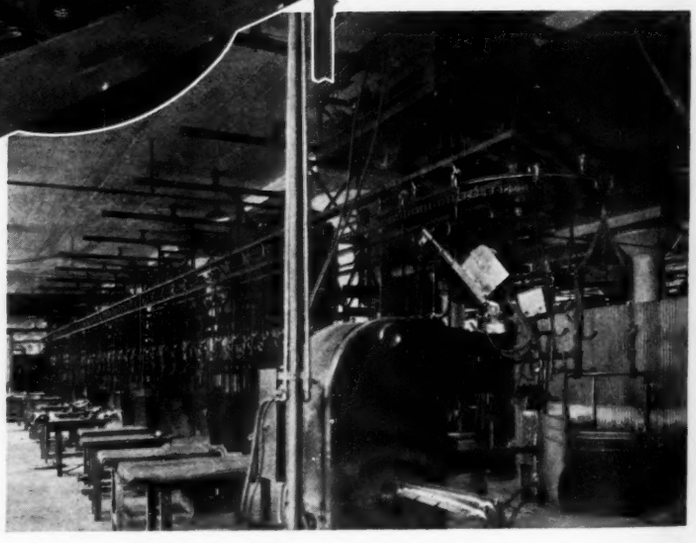
The joining is by a combination of spot welding and of folding together of edges under heavy mechanical presses. It is accomplished in two operations. In the first, outer and inner panels are fitted together and held in place in a special jig while the folding of the edges is started and a few points are spot welded. This treatment of the edges previous to the press operation is necessary to insure a smooth fold under the press dies.

After complete assembly the doors are inspected as they pass along a table conveyor, shown in an accompanying illustration. They then are ground and polished and again inspected, after which they are placed on an overhead monorail conveyor which moves the doors through an automatic spray tank where they are coated with a protective oil film before finally passing on to the shipping department. The inventory of both completed doors and raw ma-

*SLIDE and roller conveyors are used in the stockroom as shown above. At the right is a double table-type conveyor for inspection of assembled doors*



*BELOW is a section of the overhead monorail conveyor where small parts are riveted and welded to the door assemblies*



terial is held to a minimum and as far as possible the sheets which are received on one day are placed immediately into process and are shipped out in freight cars as completed door assemblies on the following day.

Material in process is transported throughout the plant by an elaborate overhead monorail system which extends for more than 2 miles from receiving platform through all departments to the storage floor and on to the shipping platform. An accompanying diagram shows the routes of three of the five main overhead monorail systems which are operated in the plant.

Many other types of conveyors are used but the bulk of the handling in all departments is with the monorail. At the first blanking operation the skeleton scrap is placed on the monorail which passes at one side of the machine, while the stampings are moved along a table conveyor to the succeeding operation at a nearby press. The scrap, using the same monorail as the parts in process, is carried to a scrap baling press at the extreme end of the manufacturing floor. After the scrap bales are formed they are forced up and onto a gravity roller conveyor which is attached directly to the baling machine.

The general scheme of handling the door parts is to use the monorail whenever it forms a convenient method. The flexibility of the monorail system makes it possible to carry the trolley hooks close to the operators even though this sometimes means partially encircling the presses or other pieces of equipment with the conveyor track. When succeeding operations are located adjacently it is usually easier to transfer the parts from one machine to the next on a table conveyor or on sections of roller conveyor placed at the most convenient height.

The inspection conveyor mentioned previously is of the table type with a second return conveyor directly underneath the one used for inspection. The doors rest on two wooden rails or stringers and are moved along by means of wooden brackets fastened to an endless chain.

A channel conveyor is used at one point in the assembly line to hold the doors on edge as they pass the points where the hinges are attached. The hinges and all other small pieces which are to be attached are brought to the assembly line in corrugated steel skids moved on lift trucks; the loaded skids, set down at convenient points, serving as temporary storage boxes.

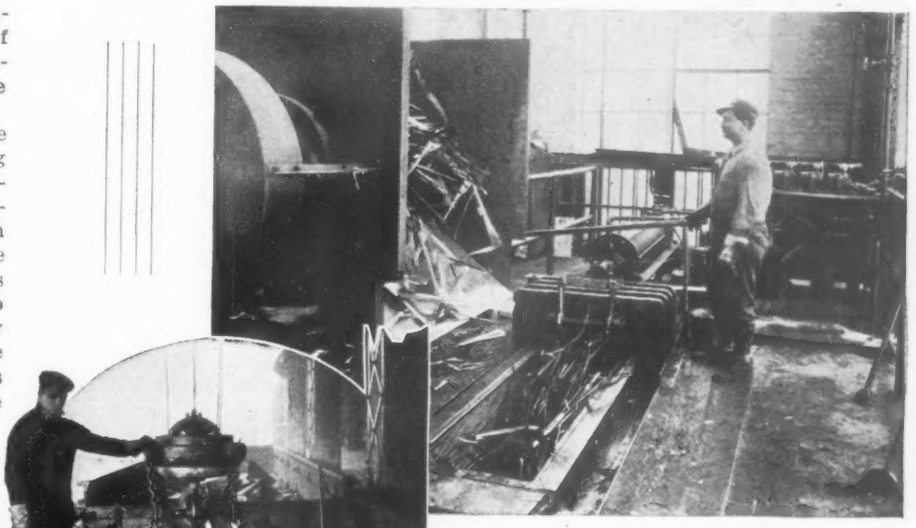
One device which has simplified greatly the production sequence is the use of a panel unit for the upholstery. The cloth fabric is mounted on sections of masonite boards in a separate department and the complete sections there are transported to the assembly line on lift trucks.

Small portable grinders are used to smooth down edges and corners after the doors have been completed. Following this belt-type polishing machines give the exterior surfaces of the doors a high polish for the subsequent enameling which is done at the Detroit plant of the company. The testing of the doors before they go to the shipping department is extensive and includes actually hanging the door on its hinges in a master doorway, where it must fit accurately.

The Edward G. Budd Mfg. Co. had its beginning 17 years ago when Edward G. Budd, a practical steel man with considerable shop experience and with a capital of $50,000 and a few associates, started the manufacture of steel automobile bodies in Philadelphia. The plant then was a small 1-story building equipped with a single second-hand press partly sheltered by a tent.

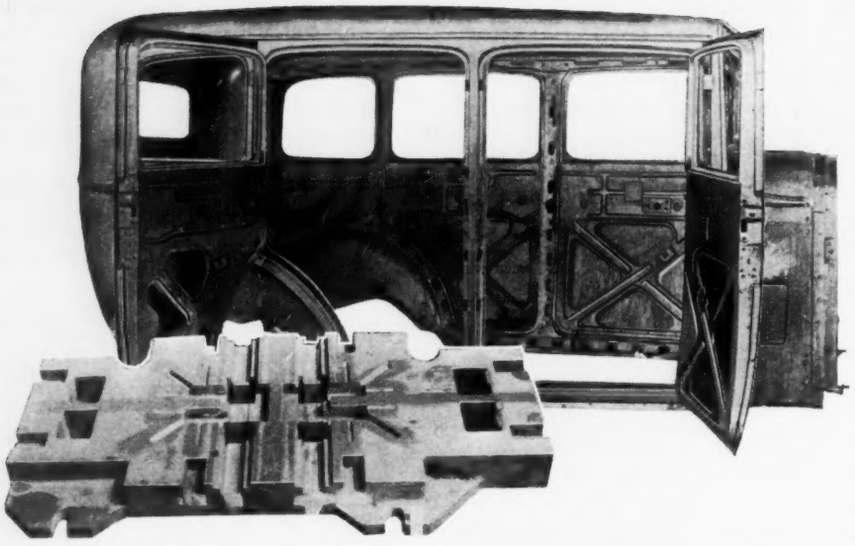
Today there are more than 6,000,000 all-steel bodies in use in the United States alone and the original second-hand press of the Budd company has been replaced by more than 600 modern presses. In a single day 1000 tons of steel sheets have been handled by these presses and the 1-story building with its canvas annex has grown into the present Philadelphia plant, with its more than 3,000,000 square feet of floor space and its full compliment of 10,000 men.

The Budd interests also control two



*SCRAP baling machine is shown above. The scrap bales are pushed automatically upon a roller conveyor which transports them by gravity to a scrap delivery room*

*UNLOADING sheet stock from flat car (right) by means of special tongs. Below is a part of the sheet and other steel storage at the plant*



*All-steel automobile body as it is shipped for finishing and assembling on chassis. Inset shows one of the elaborate forming dies used in stamping body parts*

large plants in Detroit, one in which automobile bodies are assembled and painted, and a second owned by the Budd Wheel Co., an associate concern, manufacturing various types of automobile wheels. A description of the manufacture of these wheels was contained in STEEL, issue of September 13, 1930.

## Chain Annealing Necessary as Safety Measure

Effects of annealing on chains are summarized in a 45-page booklet recently published by the National Safety council, Chicago. The work is a result of several years of investigation by a special committee of the American Society of Safety Engineers and the National Safety council.

A number of recommendations are set forth for users of various types of chain. Some of these are:

Chain used where failure may endanger human life or property should be annealed as often as careful inspection shows this to be necessary.

Annealing of chain is advisable when inspection shows the surface of individual links of the chain or the chain in general to have been cold worked by use. A cold-worked condition is indicated by battered, peened, polished or gouged links.

Servicing of chain should accompany its annealing and should include the cutting out of and replacing of links which are worn, bent, cut, gouged, cracked or show signs of the shims of the weld lifting.

Wrought iron chain should be annealed under conditions which permit accurate measurement and control of temperature.

When steel chains are heated for the purpose of removing brittleness, a low-temperature annealing is not sufficient, but the chain must be normalized or heated above the upper critical temperature.

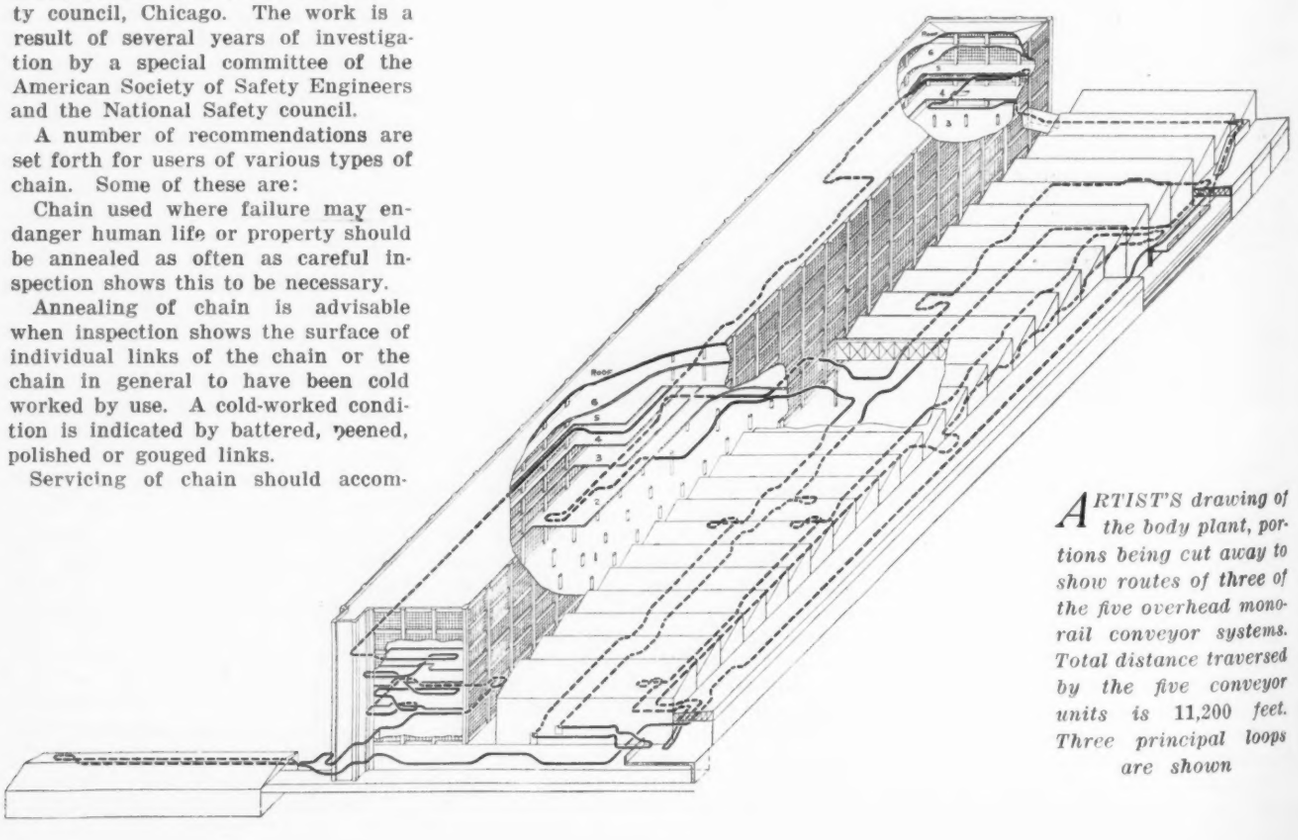
The greatest safety is desired in crane and sling chains which are used in carrying material over working men. It is recommended that, where possible, the repair and annealing of such chains be entrusted to a company making a business of this work.

When chain has become stiff or partially stiff from overloading or through repeated annealing and use, or when the cross section of the metal has been reduced materially by wear, it should be scrapped and replaced by a new chain.

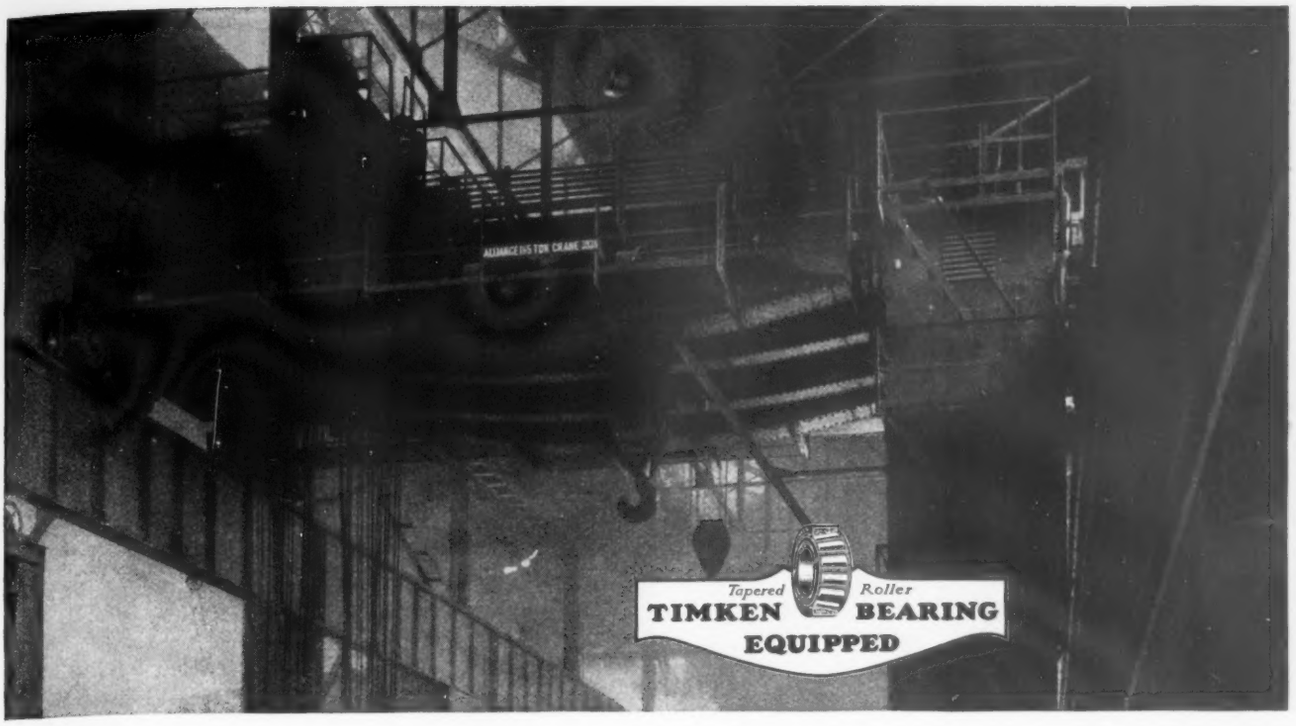
## Foundry Exhibit Will Be International in Scope

An international convention and exhibiton covering foundry subjects and participated in by various European foundry organizations will be held in Milan, Italy, during September. The exhibition, which will take place in the machinery hall of the Milan Sample Fair, will be open from Sept. 12 to 27. European foundry associations and organizations are participating and American manufacturers of equipment and supplies have been invited to exhibit.

Technical sessions will be held during the week of Sept. 13, followed by organized visits to foundries in the vicinity of Milan and later by a tour including Turin, Genoa and Rome. European foundry associations are participating actively in the congress and the American Foundrymen's association has been invited to contribute an exchange paper.



*ARTIST'S drawing of the body plant, portions being cut away to show routes of three of the five overhead monorail conveyor systems. Total distance traversed by the five conveyor units is 11,200 feet. Three principal loops are shown*




# Timken Bearings Handle Tough Assignments *in* Alliance Traveling Cranes

The same exclusive characteristics that have made Timken the dominant anti-friction bearing for railroad cars, locomotives, mine cars and other exceptionally tough wheel jobs, enable Timken Bearings to meet all modern anti-friction necessities in overhead traveling cranes.

Overcoming friction is only one of the important duties which crane wheel bearings must perform. They must be equally capable of carrying the extreme radial, thrust and combined loads developed in crane operation—specific responsibilities for which Timken Bearings are inherently fitted as a result of Timken tapered construction, Timken positively aligned rolls, Timken-made steel and Timken precision of manufacture.

Timken Bearings conserve power, save lubricant, permit more accurate handling and by maintaining maximum wheel stability they help to prevent weaving, and reduce wear on wheels and track, driving maintenance costs far below previous low standards. The Timken Roller Bearing Company, Canton, Ohio.

**TIMKEN** *Tapered Roller* **BEARINGS**

# Early Blast Furnace Practice Filled with Romance

BY G. G. BELL, ASHLAND, KY.

BLAST furnace practice followed by operators of early stone charcoal stacks involved considerable detail despite the crudeness of equipment. As related in the accompanying article by Dr. G. G. Bell, Ashland, Ky., whose forefathers were ironworkers, the early iron industry was surrounded with romance. The custom followed when blowing in a stack, details of furnace design and nomenclature of early practice are presented in an interesting manner.

MANY old charcoal furnaces stand like giant cenataphs in silent memory of the men and women who labored to produce the iron of commerce starting over a century ago, and continuing until the early 90's. The masonry on these furnaces is superb, even the exterior of the rocks that were in the stacks were champered and craneled as carefully as if they were to be stone in the structure of a present-day building. Huge blocks of stone were carved out of native rock and each craftsman left upon them his individual mark, some their initials, others figures of trees. In each instance the name of the builder, the date, as well as the name of the furnace was carved on the capstone. The furnaces took their names descriptive of the place, of Biblical characters, from mythology, from rocks, from the name of rivers, the name of owners, the pioneers in history, animals and Latin names.

### Origin of the Industry

The beginning of the iron industry in Eastern Kentucky after 1800 was not for commercial purposes, but for the purpose of aiding in the making of salt. The first charcoal iron manufactured in Eastern Kentucky was made by a man of all trades, a tanner, a preacher, a dentist and a statesman. He was a manufacturer of salt also and his process was to take the salt-bearing water and evaporate it in wooden troughs and then scrape the salt from the side of these troughs. The product was used for domestic purposes and for salting the hides of wild animals. The process of evaporation was so slow that he conceived the idea of making iron in a small furnace and casting it into pots of 40 inches diameter, called salts, and using them for evaporating purposes.

This small furnace was built in the south part of Greenup county, Ky., and the blast was furnished by man-driven bellows. It produced a ton of iron a day, and was 16 or 18 feet high and about 8 feet at the base. The stack was made of sandstone and lined with native ganister. The irksome task of furnishing the blast was accomplished similar to the blast that is furnished for an ordinary blacksmith forge. How long it took to make a heat is unknown, but sufficient metal was tapped to make several castings. After the castings were poured the stack probably was allowed to cool off, then recharged and another heat made. After the owner had supplied his little community with salt he then cast pots, pans, fire place implements, waffle irons, trivets, sad irons, andirons, shoe lasts, hammers and wedges.

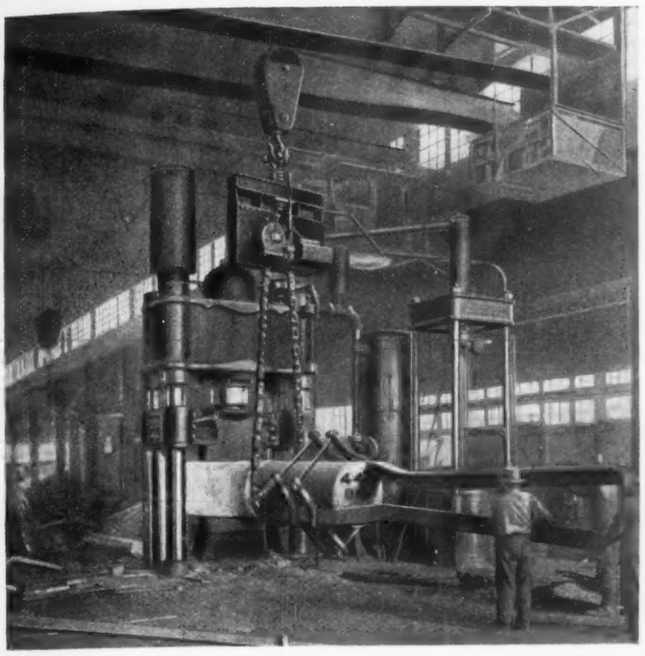
### Water Power Is Used

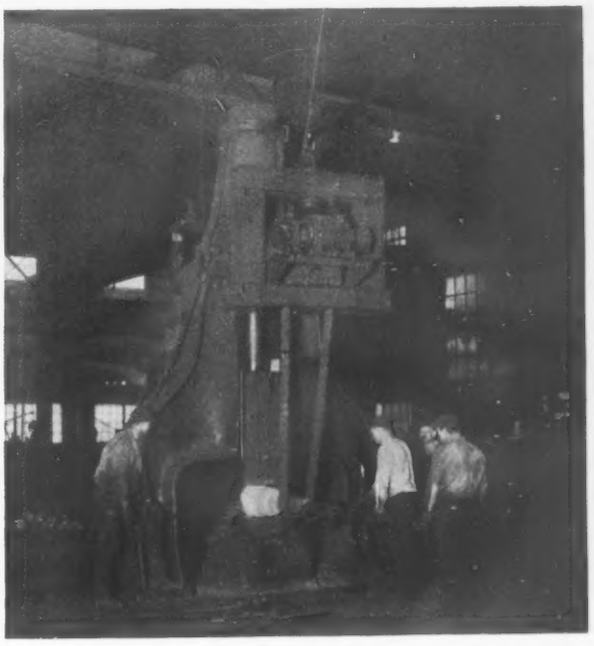
Later the owner of this stack built a dam and used an undershot water wheel to furnish power for the wooden blowing tub. The wheel actuated a rocker arm and the wheezing could be heard a long distance from the furnace. The stack made as high as 6 tons of metal a day. From time to time other furnaces sprang up and castings were shipped by water down the Little Sandy river and the Ohio river as far as Louisville.

There was no bell on the old-time furnace. A plate covered the top at times other than when stock was being charged. Charcoal iron also was worked into blooms upon the anvil by

*Bellefonte stack, Greenup county, Ky., the last stone furnace in that state to blow out. It was built in 1826 and became an ivy-mantled tower in 1893*

# Cut Hammer Time 10 to 25% by Using this Rotating Block ~ ~ ~





YOUR hammer crews spend a lot of time rotating heavy billets—time which should be spent on actual forging. An Industrial Brownhoist Rotating Block will do this hard work in half the time, will release one or two men for other work and effect a substantial saving in production costs.

This rotating block is a simple, electrically operated mechanism which is suspended from the crane hook, as shown in the illustrations, and may be controlled either from the floor or the crane cab.

After the billet is placed in the saddle of the heavy rotating chain, only half the usual crew is required to steady the billet, releasing the rest for other work. Because this block rotates the billets rapidly, it permits more work to be done on a piece in less time and often eliminates reheating.

This Industrial Brownhoist Rotating Block can be used on all kinds of hammer and press work and is built in sizes ranging from 2½ to 60 tons capacity. Our nearby representative will gladly explain the many other advantages of using this block or we will send you a copy of our Bulletin 729 which describes them.

Industrial Brownhoist Corporation, General Offices, Cleveland, Ohio

District Offices: New York, Philadelphia, Pittsburgh, Detroit, Chicago, New Orleans, San Francisco, Cleveland
Plants: Brownhoist Division, Cleveland; Industrial Division, Bay City, Michigan; Elyria Foundry Division, Elyria, Ohio

# INDUSTRIAL BROWNHOIST

trip hammers operated by cams and levers which were actuated by a water wheel. After being worked to the proper consistency the metal was spun out on an iron rod, like a huge ball of taffy. The water wheel operated a series of cams that lifted the hammer of various weights and allowed it to drop and reduce the bloom to plate. These plates were shipped to Louisville for final rolling into sheets. Some, however, were drawn out and made into nails, grill work, oxen shoes, gun barrels, forceps and other dental instruments, and farming utensils such as scythes and sickles.

The sturdiness of the German race was imported to these places to do the harder work as the iron industry assumed a commercial aspect. The English people who had learned metallurgy in their native country came as masters. Great tracts of land were bought, some numbering over 10,000

*General outline of the Pennsylvania stack, Greenup county, Ky., which made its initial cast in* 1848

acres; the price paid, if any, was probably less than 50 cents per acre. These were known as furnace tracts, and were subdivided into small hillside farms. The furnace was built in a convenient place where the bottom was wide enough for the stock bank, pot house, and the furnace site. The master's house was built nearby where a good view of the operation could be had at all times. The sheds were put together with wooden peg and pin. Even the roof was put on without the use of nails. Clap-boards were fastened with pin and pole. Vents were left at the top of the various houses around the furnace.

The stock banks were walled with native stone, nicely chiseled and craneled and the name of the builder sometimes appeared upon these as well as the name of the furnace. When a new furnace had been built and all was in readiness for starting, a holiday was declared and all attended the ceremonies of lighting the first fire and making the first cast. The coal burners that had become an ebon color from the grinding of the particles of charcoal were washed spick and span and looked even whiter than their fellowmen, because they had been so long covered with this grime that it acted as a protective and bleaching agent to their ruddy skins. The men who had gathered and dug ore had to remove all vestage of ore stain, save from their finger nails and their gray hair and beards.

The women and children of the family came; the aristocrats and the owners and visitors from other furnaces. Songs dear to our forefathers were sung and one lady fair, probably the betrothed of the iron master's son, lighted the first fire. This usually was done just after sun up, and as the flames spread and the charcoal was ignited, and later on the blast applied, a new furnace was put into operation, a new community was born to do its bit towards founding a great industry; the forerunner of the iron age west of the Alleghenies.

Salts, those huge kettles that were the foundation of the industry in this community, now were put to a different use. After being filled with succulent vegetables, pieces of prime steers, condiments that were brought from the Continent and spices, the contents were boiled and made into burgoo, ready to serve for the noonday meal.

### First Cast Required 36 Hours

Quarters of beef were barbecued, heaps of sweet potatoes baked in trenches and large loaves of bread baked in outside ovens. These were placed upon improvised tables and the feast served. The blast was applied and the test of a new furnace was at hand. About 36 hours was required to produce the first cast. The ironmaster, sure of his ability, mingled through the crowd and received congratulations. Both young men and young women stood upon the wooden runners and pressed their initials in the pig bed, for it was an old superstition, probably coming from England, that if the initials of a young man and a girl were broken off in the same piece of iron from the first cast, they would be married and the bonds of matrimony would prove as strong as the bonds of iron. Romace has it that one stroke of the ironmaster's hammer, and he could join those initials that he most desired.

Being a day of romance neither the practical nor the sentimental was overlooked. The commissary, a spacious building, was heated with an open fire place, a large pudgy chimney being at one end and a double door at the other. This room was turned into a place of gathering for the night. A popping fire was built in the fireplace and at one side a platform for the musicians. After the crowd had gathered old-fashioned square dances were enjoyed. As the evening wore on refreshments were served consisting of cold sliced meat, native fruits, nut salad and cider, and there was parched corn and nuts that had been roasted on the hearth for the children. All the gayety and color of the fall forest was embodied in the wearing apparel of the old and the young women. The men's apparel was of course more somber.

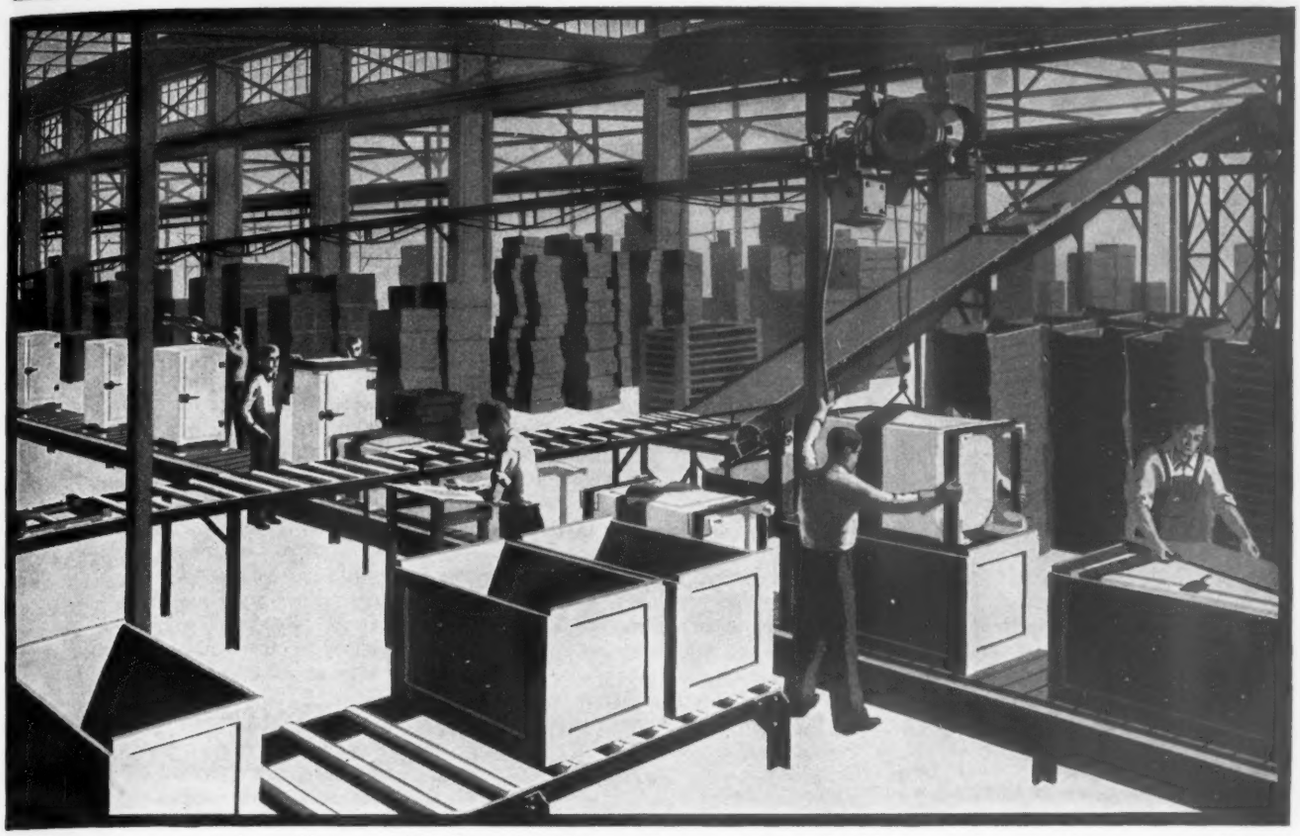
However, an occasional gay-colored kerchief protruded from the pocket or a gay-colored necktie adorned the throat of those who were more pretentious. The dance continued well into the night, and when the horn blew to announce the time for the next shift to come on duty at the furnace the party broke up and went to their respective homes. Having refreshed themselves throughout the day, they returned to the furnace at night, the second evening of the life of the new industry. They gathered around the pot house and waited until the furnace was tapped.

When the top of the furnace was removed for a filling instead of a great spew of carbon flying out and

*Laurel stack, Greenup county, Ky., with its base of solid stone,* 30 *feet square and* 14 *feet high, hollowed out in the center to receive the hearth and bosh. Its total height may be compared with the man standing near the opening*

dirty unsightly smoke, a pale blue smoke arose and a gust of wood ashes was blown out to settle down on the mossy banks of the hillside.

All the picturesqueness is gone save the stones of the furnace proper and the master's house which was of early American architecture embodying some of the English. The front door was spacious and paneled, over which there was a fan light and on either side of which were small panes of glass. The windows usually had 12 panes to the sash and were in alignment, two in either room upstairs and down. The attic was lighted with fan lights on either side of the big stone chimney. The first floor had big open fireplaces on either end, the second floor had none. The kitchen, much larger than the present day kitchen, used an open fire place for cooking and was floored with poplar wood that was sanded and bleached. The other rooms were floored with white or black



*Gravity rollers, power belts and power pallets form this Mathews Conveyer System used by a prominent refrigerator manufacturer*

# Your *next* exploration ...one of handling costs

Your plant, like thousands of others, undoubtedly has its handling cost mystery, with the general practice of entering these costs under the "manufacturing overhead" burying them so deep that your best efforts as a sleuth would prove futile. Turn your attention, then, from the past to the present. Begin today an exploration that will give you a true insight of what price is being paid for transportation within your plant. Study current costs, and, if they prove abnormal, consider a Mathews Conveyer System as a means of reducing them, as well as for providing greater speed in production. Engineered to fit your particular handling work and constructed to withstand whatever conditions may exist in your plant, a Mathews Conveyer System assures the savings of handling dollars over a period of many, many years. Write for the interesting Mathews catalog.

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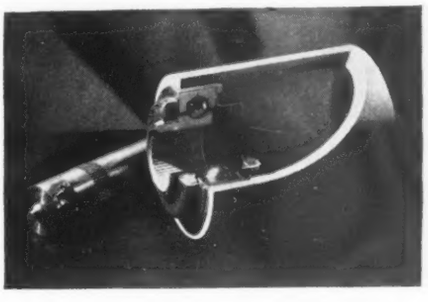

## MATHEWS CONVEYER SYSTEMS

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*"Amanda, A. D. 1829," is the inscription chiseled in the native stone wall which enclosed the stock bank of this stack in Greenup county, Ky.*

walnut with large wide boards and the dining room usually was paneled. Slate brought from Pennsylvania sometimes was used for roofing and sometimes clapboards. A spacious warming house stood in the rear for storage and a well, with a sweep, stood in the front yard. The housing of the wood chopper was a low stock shed scarcely high enough in which to stand erect. Sometimes men came from nearby counties to chop wood after their crops had been laid by. They chopped wood by daylight and racked it by moonlight. This was the most laborious task of the iron industry.

**Earnings Restricted**

The man who took up the wood after it was corded was known as an under manager and he gave out the plots of ground over which the men were to chop. The furnace workers always were docked whether they dug ore or chopped wood. If they stacked the wood too loosely they were docked, or if the wood was in too large pieces, they were docked. If the ore was thin, they were docked, or if it was wet, they were docked. There was always some way in which to cut from their earnings. Ricks like cooperage wagons were used to haul charcoal, and were pulled by oxen from the charcoal beds to the furnace. The charcoal frequently would fire upon its journey from the pits and a bucket was carried that water might be taken from water holes to quench any such premature fire.

Carts were used to haul the ore and sometimes a long journey from the furnace up the haul road was necessary. Women as well as men dug ore. When they were not hunting ore, they were digging ore, and when they were not digging ore, they were hunting ore. Ore seemed to be their entire life as well as the life of the furnace.

The nomenclature of the early blast furnace is interesting. The ore, 85 to 92 per cent nonmetallic, was burned before it was put into the furnace, being covered with braze which is fine charcoal and brans which is the uncharred part of the wood in the charcoal pit. It was set upon logs. The men who placed this ore in long kilns were called ore setters; it usually took some weeks to burn the ore. If the ore fused in the process of burning, it was said to loop; if it fired too much at one point a mixture of charcoal dust and dirt, called green dust, was thrown over it. The word bosh meant to daub up, as one would daub the leak in a chimney; it also meant the larger part of the interior of the furnace; and, the large wooden trough made by hollowing out a log in which the mud was kept for daubing up purposes. "Gone to pot" was an expression used when the iron was poor; which quality was used for casting purposes, the better quality being used for commercial pig iron. The top of the furnace

*Remains of the Buffalo stack, Greenup county, Ky., which was built in* 1855 *and produced* 3000 *net tons of charcoal iron annually*

was called the bell; the casting house the pot house; and the air cylinder, the blowing tub. The chunk of material left at the bottom of the furnace was called a soogan. A mixture of spherules of iron and slag was called bull dog.

**Believed in Omen**

Superstition entered into the making of iron in the early days. Salt peter from the caves in the rocks was added to the charge of the furnace as well as sand and salt. The time of lighting the furnace had some superstitious meaning. No doubt the addition of sand and salt helped to glaze the inside of the furnace. The size of the hearth regulated the time of casting; when the hearth was small the furnace was cast every six hours, but as the hearth burnt out, the casting time was moved up to every eight hours and then to every 12.

Some of these early furnaces are in a good state of preservation. Mount Savage stack looks as if she had been blown out yesterday and the inside is as slick as a churn; Boone furnace is relined and the hearth is set ready for the bosh; the masonry looks like it had been turned in a potters wheel instead of being built piece by piece. Laurel furnace is cut from a solid stone; the base about 30 feet square at the bottom and about 12 or 14 feet high is one large monolith that is hollowed out in the center to receive the hearth and part of the bosh. This huge stone was not left rough but was cut smooth and craneled, the corners being chased out with a chisel like a ribbon running down either side of each corner. Over the capstone are cut these words "Laurel, Built ———" the rest of the inscription the weather has destroyed. Huge piles of stone and rock in shapeless form are all that now remain of Amanda.

**Few Landmarks Remain**

The modern builder has taken the sides of old Bellefonte for foundation and chimney pieces. A slag pile alone marks the site of Clinton. Sandy has fallen down. A red-scarred hillside is all that remains of Star; while Buena Vista leaves behind a mere fragment of its former self. Steam, Pennsylvania, Hunneywell and Hopewell still retain their general outline as good today as ever, but the inner lining has dropped from the wear of elements and fills up the bottom closing the three vents for air, iron and cinder with cairns of rocks. Kenton, Hampshire, Buffalo, Enterprise, and Raccoon look like ivy manteled towers and being closer to thoroughfares often are visited. One furnace alone left no scar of slag pile. They flushed into the river and as the slag was checked into tiny bits or blown up in foam the slag made its way down the river to oblivion.

Metal made in these crude but simple furnaces varied from 1 to 25 tons a day. Charlotte at Iron Hill was the first to use an iron jacket. It was built along the line of the present-day furnace and was lined with ganister and firebrick impregnated with charcoal. Steam was the motive power. The stack made 25 tons in 24 hours. Part of the jacket was made of cast iron bolted together and cast at one of the adjoining furnaces. Many segments were required for this stack which in recent years was torn down and the iron recovered. People followed the business of hauling the soogan from these furnaces after they were blasted apart and melted in the modern blast furnace.

Many experiments were tried in old charcoal furnaces using stone

coal but not with much success. Princess furnace operated with stone coal, was the first to be built for this purpose in Eastern Kentucky. Later when the stack was moved to Low Moor, Va. the slag was reworked. Several foundrymen lost their jobs because they could not make iron with stone coal in the old-type charcoal furnace. Most of these furnaces used cold blast and operated on 3 to 4 pounds pressure. However, the last to blow out—Bellefonte—was converted into a hot blast furnace in its later years. The stack was built in 1826 and made its last iron in '93. It was believed by these early ironmasters that stone coal would mark the ore, that is, it would have a sort of prenatal influence and for this reason stone coal was not used for burning the ore. All iron was graded by fracture and it was described as open, opener, openest.

# Curve Indicates Specifications for Acceptable Arc Welding Steel

POROSITY of weld or deposited material has constituted a baffling problem in the application of electric arc welding. What causes one weld to be solid and dense and the next to be porous? Variability in the steel itself is believed to be the answer.

As a result of extensive research on this subject, Wilmer E. Stine, research laboratories, Lincoln Electric Co., Cleveland, reached conclusions enabling him to develop a graphic formula, known as the Lincoln-Stine equilibrium curve, by which it is claimed that exact specifications for steels of good weldability can be determined.

Difficulties encountered in producing sound welds in various grades of steel heretofore were thought to be due to the electrodes and process employed, but the investigator believed the difficulty lay within the steel. To prove this contention, research beyond the usual analysis of steels was necessary. Data were collected from steel producers as to exact conditions and methods under which the steel samples to be tested were made. With this information, thousands of samples were welded, tested and analyzed, the results forming the basis for the curve.

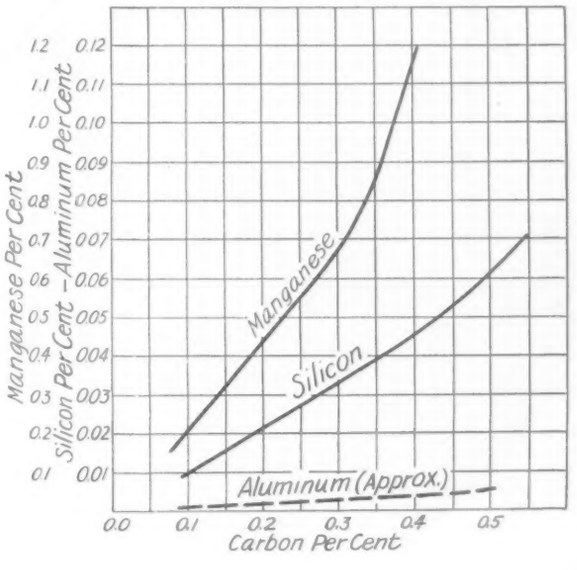
### Formula Indicates Analyses

How to determine the correct proportions of the elements in the steel for best welding is said to be a simple matter when using the accompanying graphic formula. For example, if steel having 0.20 per cent carbon is required, the curve shows that the silicon content should be approximately 0.021 per cent and manganese 0.40 per cent.

If the steel has been deoxidized in manufacture by addition of aluminum, the amount of this element present should not be more than 0.002 per cent. The aluminum content should be avoided or kept low because aluminum content is difficult to determine by analysis, and the presence of aluminum oxide is objectionable because of its high melting temperature which lies between the maximum steelmaking temperatures and maximum arc welding temperatures.

In arc welding steels, produced according to the equilibrium curve, there is said to be no chemical reaction when the temperature of the metal falls to the point only slightly above the temperature at which steel solidifies. It is only when such chemical equilibrium is obtained that minimum porosity of weld metal is assured, which in turn, means denser, stronger, tougher welds.

In conducting the research, the investigator also felt that in steels not having the proper proportions of elements for good welding, chemical equilibrium at the proper temperature might be brought about by the use of a corrective flux or autogenizer fused into the steel during the welding process and during the research developed fluxes or autogenizers for this purpose. Thus, when it is found that the composition of the steel on hand does not meet the requirements indicated by the graphic formula, the steel can many times be satisfactorily welded when such balancing flux or autogenizer is applied.




*Curve for determining analysis of steels best adapted for arc welding. For example, the proper analysis for an 0.18 per cent carbon steel is shown to be 0.019 per cent silicon and 0.37 per cent manganese. Aluminum additions should be avoided or kept very low*

## Issues Booklet on Sheet Metal Tolerances

Commercial practice of American manufacturers with regard to stock thicknesses or weights of sheets and plates of common metals and alloys is discussed in a 32-page booklet, No. 391, recently issued by the bureau of standards, Washington. The information and data pertain to the specific applications of customary gages to various metals and alloys and include gages or stock lists for sheet and metal widely used in Europe, particularly England, France and Germany, and in Japan. Manufacturing tolerances adopted by American technical societies, manufacturers' associations, and standardizing bodies, or used by leading manufacturers are accompanied by 37 tables.

## Belgian Fills Vacancy

The Hoover Foundation for the Development of the University of Louvain has appointed Paul Van Zeeland, professor of economics, University of Louvain, to the American Engineers Memorial committee which has charge of the carillon of 48 bells presented in honor of the American engineers who died in service during the World war, according to word received by the Engineering Foundation.

Professor Van Zeeland succeeds the late Baron Julien Liebaert, formerly minister of state of Belgium and president of the Hoover foundation, who died in 1930.

Artisans of France, England and America fashioned the huge clock and carillon, formally presented in 1928.

# *Express Service* O

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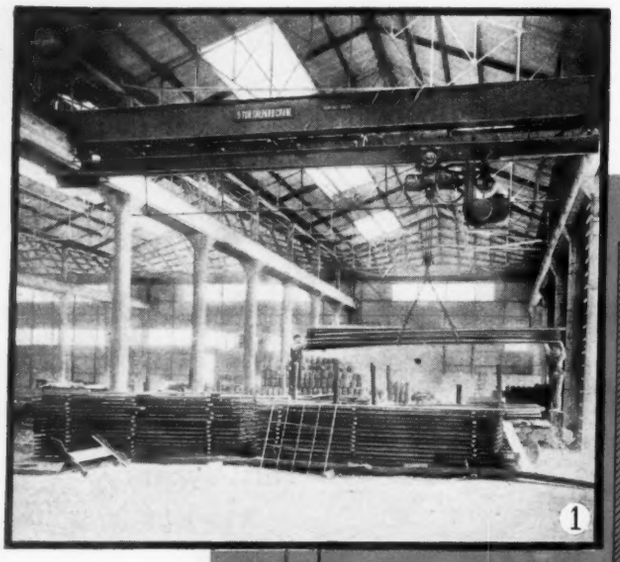
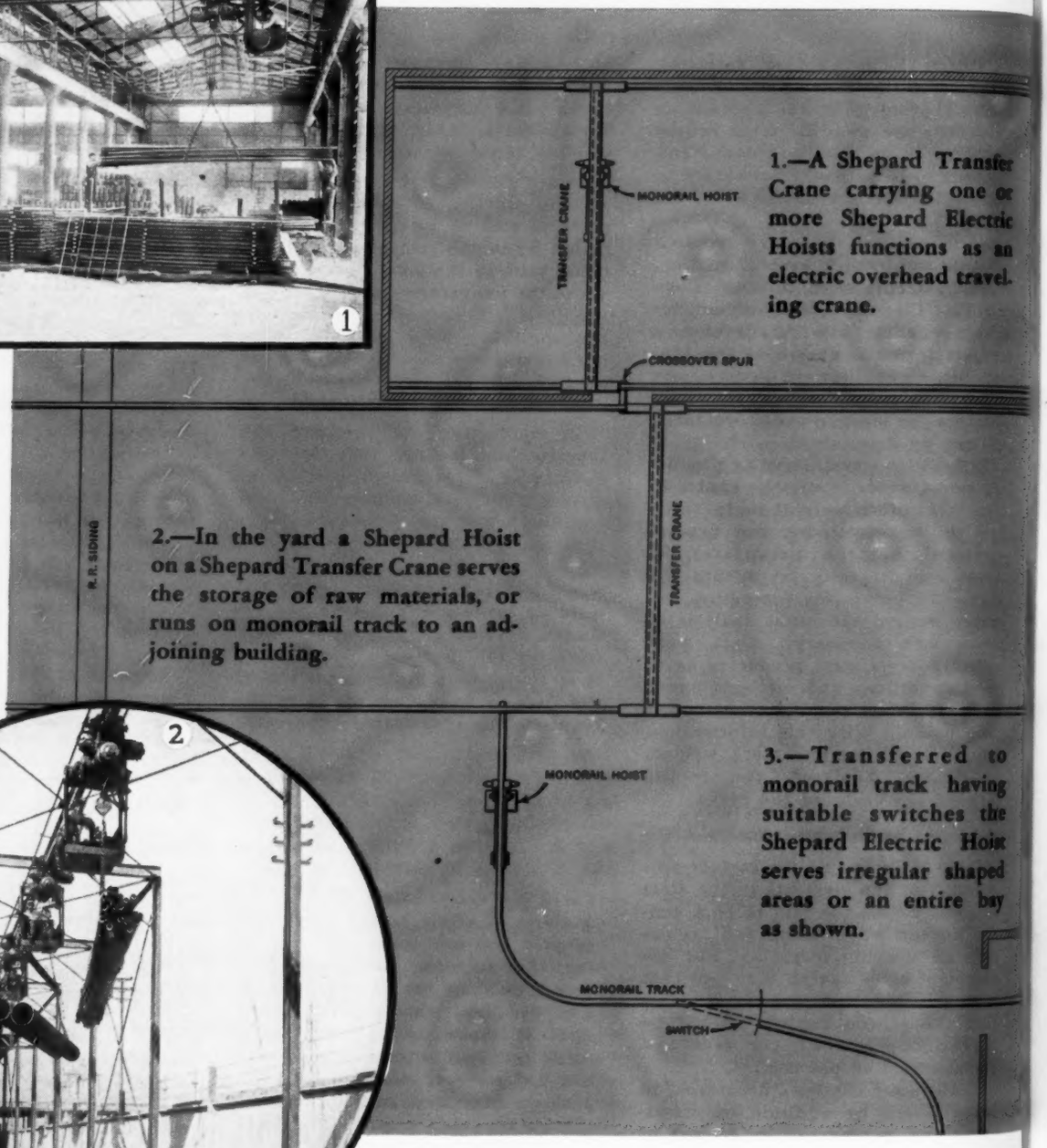
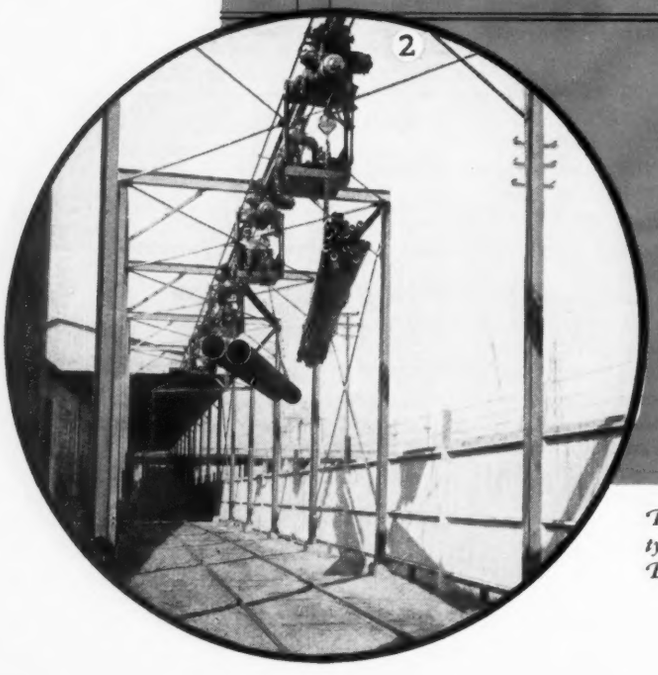



1.—A Shepard Transfer Crane carrying one or more Shepard Electric Hoists functions as an electric overhead traveling crane.

2.—In the yard a Shepard Hoist on a Shepard Transfer Crane serves the storage of raw materials, or runs on monorail track to an adjoining building.

3.—Transferred to monorail track having suitable switches the Shepard Electric Hoist serves irregular shaped areas or an entire bay as shown.




*Detailed description of this system of overhead load handling and many typical applications are contained in Shepard's "Aerial Railway of Industry" Bulletin. Write for a Copy.*

# Automatic Control of Open Hearths Wins Approval

CONSIDERABLE attention is being given to mechanical draft and combustion air supply in open-hearth furnace practice. For a 125-ton furnace with mechanical draft a 10 per cent fuel saving has been reported, the tons per hour remaining unchanged.

These statements were included in the report of the committee on furnace design and construction which was presented at the thirteenth semi-annual meeting of the open-hearth committee of the American Institute of Mining and Metallurgical Engineers, held in Chicago, May 13 and 14. Despite slack conditions in the steel industry, attendance surpassed all previous records, more than 160 being present at the opening session.

A new silica brick developed in this country, the chairman stated, is giving satisfactory service and an open-hearth furnace roof built with this brick has shown approximately 25 per cent better service. A new European refractory recently introduced in this country, composed of 95 to 98 per cent magnesia, has proved satisfactory. Clay-bond silica brick has given contradictory results. Tests with various refractory cements for lining water-cooled doors in monolithic structures have given both good and bad results. Roof construction tends towards the use of heavier brick, the sprung roof being universally used. The suspended-arch roof has proved impractical. Another installation of the flat-arch roof has been made but, the chairman reported, no information of its performance yet is available.

### How Changeover Is Effected

At prevailing prices, the chairman reported, fuel oil becomes attractive for open-hearth purposes. Where it is desirable to adapt a producer-gas furnace to oil firing, an efficient furnace may be constructed by merely changing the design above the floor level, still retaining the double slag pocket and three uptake features. The idea consists in removing the gas ports and throwing an arch across the top of the gas uptake. The arch serves as a floor or base on which a small port, with a water-cooled nose, is constructed to house the burner. Openings are made in the division wall, between the gas and air uptakes, of sufficient size to provide for the necessary heat distribution to all slag pockets and regenerators. The roof knuckle is raised to a point only 6½ inches below the roof; no change is made in the end roof over the ports and uptakes.

Use of natural gas as an open-hearth fuel, according to the report, is becoming more extensive, with considerable experimental work being done. A furnace is reported making 120-ton heats in less than 11 hours on cold metal practice with a fuel consumption slightly over 4,000,000 B.t.u. per ton. The natural gas is admitted through side burners at approximately 1 pound pressure and develops a low velocity flame with rather high luminosity. Another natural gas-fired furnace is making 10 tons per hour consuming 4,000,000 B.t.u. While these particular instances are above the average, they demonstrate the possibilities of natural gas as an open-hearth furnace fuel.

### Other Subjects Discussed

The report concluded with comments on improved furnace equipment, such as ports, tightly-closing doors and peep-hole covers, frames which eliminate the brick arch above the door opening, and improved damper type valves and valve hoods.

In speaking on the automatic control of open-hearth furnaces, Prof. W. Trinks, Carnegie Institute of Technology, Pittsburgh, mentioned that a pusher fan is required for delivering air to the furnace. He warned, however, that the use of a pusher fan as a device to stimulate production of a furnace may lead to difficulty, and cited cases where abuse of the pusher fan has resulted in a short time, in filling up the checkers solidly.

The discussion indicated automatic furnace control has won the approval of open-hearth superintendents. Cases were cited where installations of this character have effected savings of 25 to 30 cents per ton of ingots. It also developed that purchases of control installations usually are made on a one-year amortization basis. Stress was placed on the need for absolutely tight furnaces to enjoy full benefits of automatic control apparatus.

Unless air leaks are eliminated, or reduced to a minimum, there is need for continuous adjustment of the air-fuel ratio. One speaker contended that the principal value of automatic control is that it forced the elimination of air leaks. In this discussion, the custom of Belgian and French steelmakers, of covering their furnaces, top and bottom, with steel plates, was recommended as worthy of more extensive emulation in this country. Another speaker declared that a furnace equipped with automatic control had not given any improved results until after the furnace had been insulated and covered with steel plates.

"Experimental work of the United States bureau of mines on open-hearth metallurgy has been concentrated for the last six months on the production of high-carbon steel of forging grade," said Dr. C. H. Herty Jr. "The work has centered on the treatment of this steel with the manganese silicon alloy developed at the bureau in the program of work on the physical chemistry of steelmaking. The alloy used in open-hearth work is a silicospiegel containing 20 per cent manganese and 4 per cent silicon. This alloy is added to the bath at a predetermined carbon concentration, the amount added being about 60 pounds per ton. About 10 minutes after the addition sufficient ferromanganese is added to meet the required specifications and about 5 minutes later the heat is tapped. This practice insures a bath low in iron oxide and at the same time free from silicate inclusions. Ferrosilicon is added in the ladle and the heat held as long as possible over the molds. It has been found that this practice results in a steel which is relatively free from internal seams, and, if the steel is properly heated, in low chipping costs. It has been found advisable to heat this steel hotter than usual because it is denser.

### Slags Melt Lower

"Another investigation of considerable importance is the determination of melting points of slags composed of manganese oxide, silica and alumina. Certain slags containing these three oxides melt at 800 to 850 degrees Cent., about 300 degrees lower than any slags which have hitherto been investigated. This work furnishes the foundation for deoxidizing alloys composed of manganese, silicon and aluminum."

Merits of the nonluminous flame in the open-hearth furnace, as compared with the luminous flame, were given much attention. The only merit of luminous flames, it was stated, is that the furnace operators can see them. Luminosity, it was pointed out, means incomplete combustion and a lower temperature; a luminous flame also was held to be harder on the brickwork. One speaker, in citing his experience reported that the nonluminous flame goes with the best practice. With this type flame, he said, it is a matter of having hot air, the correct air-fuel ratio, and a furnace design which will permit high turbulence in the combustion stream with a proper

dissipation of this turbulence in the hearth itself.

Interest was expressed in connection with recent experience with 2 and 3-pass checkers. Some failures were reported, but there also have been some entirely successful installations. One furnace equipped with 2-pass checkers made 738 heats. The reason for closing the furnace down at the end of this campaign was that the checkers became clogged, and the temperature was not sufficient to burn the particles that were carried over. It was thought that in this case, a checker temperature of 2000 to 2200 degrees, with a short flame, would have resulted in a run of at least 1000 heats, because the openings in the first pass had not burned out more than 50 per cent.

This furnace was operated both on fuel oil and a mixture of blast-furnace and coke-oven gas. The checker openings were 6½ x 6½ inches. Three-pass checker furnaces apparently have not yet established themselves fully. One installation was mentioned, with checker openings of 64, 36 and 21 inches, respectively, which made 162 heats. The discussion showed that 2-pass checker arrangements resulted in reducing efficiency of waste-heat boilers, while in one 3-pass installation not enough heat remained in the products of combustion to operate the waste-heat boiler. Opinion however, was expressed that the efficiency of waste-heat boilers is decidedly secdary to conservation of heat in the open-hearth furnace.

**Checkers Cleaned in Operation**

Various methods of cleaning checkers were discussed. One plant, with furnaces operated on producer gas, cleans the checkers while they are in operation. A sand blast is directed into the checkers by a short length of ¾-inch steel pipe, and the sand, not more than 4 or 5 pounds, is scraped out of a manhole opening. One operator reported burning tar, getting runs of 500 to 700 heats; by using a short flame, there is no marked deposition in the checkers. This operator said his method of cleaning was to blow out the checkers with compressed air, large manholes being provided for cleaning out the bottom checkers.

These methods were held as much better than cleaning checkers by removing brick, because this interferes with operation and results in brick breakage. Maintenance of a temperature of about 2100 degrees in the checkers keeps the need for cleaning to minimum. Stress was laid on the inadvisability of pushing furnaces too hard.

Discussion of furnace insulation was introduced by S. M. Jenkins, Armstrong Cork & Insulation Co., Lancaster, Pa., which was along the lines of an article by this author in STEEL of April 16. Discussion showed that insulated checkers in one furnace saved 10 gallons of fuel oil per ton of ingots, and an insulated roof lasted two and a half times longer than an uninsulated roof. Another furnace had a saving of 4 to 5 gallons of fuel oil per ton of ingots. The roof of one furnace, after running 120 heats, was insulated and then ran a total of 456 heats; this roof was insulated to a depth of 2½ to 3½ inches, ribs and all.

It was pointed out that with insulated roofs, care must be exercised to prevent burned spots in the refractory material in the roofs. Discussion on insulation revealed a tendency toward thinner furnace walls, as investigations with thermocouples showed that temperature changes occur in the walls only to a depth of 4½ inches, remaining practically uniform from that point to the outside of the walls.

Dry valves were reported out of the experimental stage. Valves of this type have been in operation for four years. Such installations include dampers made of heat and corrosion-resistant alloy steel, seated against both water-cooled and alloy seats. Some of these dampers are built sectionally, of tongue and groove construction, in order to allow for expansion and contraction.

Questions by the chairman, L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O., failed to reveal that any of the open-hearth furnace superintendents using oil as fuel notice any increase in iron oxides. The tendency is toward the use of heavier oil, due to the fact that such oils are lower in price than light oils. One operator now is using 28 to 30 Baume heavy oil, saving about 40 cents per ton of ingots compared with costs on 18 to 22 Baume oil. Despite the greater B.t.u. value of the heavy oil, consumption is 0.4 to 0.6 gallon more per ton of ingots than with the lighter oil.

**Meter Trouble Reported**

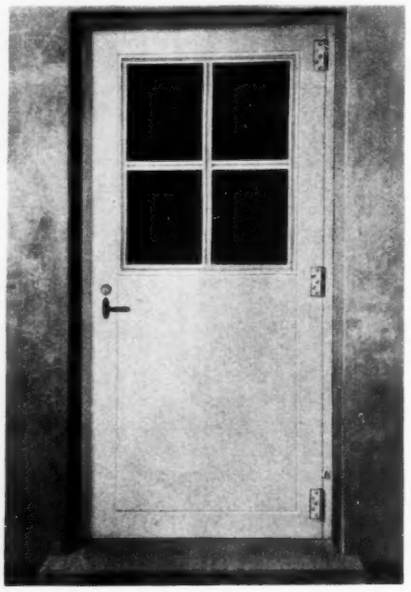
Asked about their use of pig iron when going to oil from gas, some operators reported consuming slightly more pig iron and others slightly less. Some thought oil might increase oxidation loss by careless practice, the reason being that oil readily develops great heat, and there may be considerable excess air present without the furnace operator knowing about it. Trouble with orifice-type meters was reported in connection with the use of oil. One speaker said that with this type of meter it is essential to determine how the meter acts under operating conditions, since the meter is apt to show variations of more than 10 per cent.

Prevailing opinion was that 1.75 to 2 per cent manganese content in pig iron was beneficial in the manufacture of mild steel for deep drawing purposes. It also was generally believed that steel made from hot metal has slightly more uniformity than when made from cold metal. Discussion of the solubility of gases in steel revealed nothing so much as a need for research in this field.

Two addresses on safety work in steel plants showed great progress in reducing accidents. In one plant, so far this year, minor accidents have been 59 per cent lower than in the same portion of last year, while lost-time accidents have been 29 per cent lower. It was stated that to make safety work effective, full cooperation of the management is needed. At the plant reporting the above figures, penalties, such as layoffs, are employed in forcing the employes to observe safety rules.

## Employs Pressed Steel for Stock Doors

INDUSTRIAL doors designed for industrial buildings are being introduced by the Campbell Industrial Window Co., New York. Tubular stiles 4½ inches wide and rails are combined with pressed steel moldings and muntins. The moldings, muntins and steel panel below are placed in the center of the stiles and rails, the door presenting neat, finished appearance. Heavy channel reinforcements are placed in all corners of the door to give rigidity and provide for door checks. The frame can be shipped knocked down, assembled on the job and used for either right or left hand swing doors.



# Electric Furnace Provides a Flexible Melting Unit

FLEXIBILITY of the electric furnace in making various mixtures of gray iron was pointed out as a marked advantage by J. H. Vogel, assistant superintendent, the York Ice Machinery Co., York, Pa., who, in co-operation with J. C. Bennett, metallurgist of the same company, presented a paper on the melting of malleable and special gray iron castings in an indirect arc furnace of the 1-ton rocking type, at the annual meeting of the American Foundrymen's association in Chicago, May 4-7.

Illustrating this flexibility factor Mr. Vogel mentioned that his company during a day's run had poured ordinary gray iron for small pressure castings, low-carbon gray iron with 2 per cent nickel for manifolds, high-phosphorus iron for piston rings, and malleable iron for large connecting rods. A summary of the costs involved showed: Power, $7.93 per ton of iron poured; refractories, $2.55; electrodes, $1.82 ; labor, $1.40; and interest, depreciation and repairs, $2, making a total of $15.70, with refractories offering the best opportunity for further reduction in costs. The normal gray iron charge was shown to be 60 per cent borings and 40 per cent of the company's own scrap.

### Improved Quality Sought

Production of iron cylinders and cylinder head castings in a 3-ton-per-hour electric furnace in an effort to obtain a consistently better grade of iron than was possible by cupola melting alone was described by H. E. Bromer, metallurgist, Standard Foundry Co., Racine, Wis. He pointed out that during periods of slack demand melting from cold stock in the electric furnace proved economical and emphasized the close control of chemical analyses and physical properties possible through the electric furnace method, particularly with respect to strengths and hardness.

Regulation of atmospheric moisture and the effect of excessive oxygen on the chilling of cast iron when pouring into light castings was the subject of the paper by N. A. Moore, metallurgist, the Piston Ring Co., Muskegon, Mich. He described the installation of a refrigerator system for the control of moisture in the blast resulting from seasonal conditions. The effect of excessive moisture in the cupola blast, and its relation to the oxygen content of the iron was developed. He also stated that apparently the fluidity of cast iron is affected by the oxygen content.

Evidence seems to point to the fact that phosphorus strengthens gray iron in its resistance to heat and thus delays the "growth"; also that phosphorus increases the resistance of the gray iron to acid attack to an important extent. These points were made in the Belgian exchange paper of the Belgian Foundry Technical association, by J. Dessent and M. M. Kagan, Liege, Belgium, and read by J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.

Regarded as an important contribution to the study of phosphorus in general gray iron practice, this Belgian work pointed out that the phosphide as it commonly occurs in gray iron is the ternary eutectic rather than a binary eutectic as has been generally supposed. Further it was stated that a low percentage of phosphorus with low silicon assists in the formation of graphite to a decidedly feeble extent, but that higher percentages are practically without effect.

The exchange paper of the French Foundry Technical association, written by Maj. Pierre Nicalou, Paris, and presented by R. F. Harrington, Hunt Spiller Mfg. Co., Boston, discussed various methods for testing cast iron. Three tests were favored—the static bend test, shear test and hardness test. In discussion of this contribution, John Shaw, Southsea, England, presented the British viewpoint in favoring methods different from those in use in either France or this country. He claimed that the shear test does not give a true indication of the strength of the casting.

Grain size and moisture content of molding sand are the main factors which influence the surface quality of a casting, according to results of a research undertaken by W. G. Reichert and D. Wooley, metallurgical engineers, Singer Mfg. Co., Elizabethport, N. J.

### Metallography Is Topic

A treatise on the microscopic examination of metals for the practical study in the gray iron foundry, and for the younger metallurgist was presented by R. M. Allen, consulting metallurgist, Bloomfield, N. J., who termed his paper a practical handbook for general service. General instructions on the use of the microscope, preparation of specimens, use of etchants, etc., were described.

Melting practice, cupola operation, methods for the preparation of various types of high test gray iron, tuyere design, coke, fluxes, scrap, briquetting, refractories and mechanical charging of cupolas were illustrative of the wide range of subjects discussed in the three shop operation courses conducted for gray iron foundrymen. Operating details and pertinent information on modern foundry technique were furnished by a large group of engineers actively engaged in some particular phase of gray iron foundry operation.

# Seek Standard Cost Methods for All Branches of Foundry Industry

ACTIVITIES of the cost committee of the American Foundrymen's association were reviewed at a cost session of the annual meeting of the association. It was pointed out that in co-operation with the Malleable Iron Research institute and the Gray Iron institute, cost systems have been prepared for the malleable and gray iron branches of the industry. At present the Steel Founders' Society of America is working on a standard cost method, and the cost committee is reviewing this report, planning to make such recommendations as will keep the fundamentals the same for all the industry.

Recently the committee has been considering a definite method for estimating costs. Several subcommittees have been appointed to consider two phases of this work. The report of the subcommittee to formulate data which should be supplied when estimates are requested was presented by Robert E. Belt, Malleable Iron Research institute, chairman. This report states that inquiries from buyers of castings should contain information regarding the following:

Metal specifications; sample casting or detailed drawing, actual or estimated weight of casting on drawing; number of pieces ordered of each pattern with delivery dates and schedules; description of available pattern equipment and its condition, indicat-

ing type of pattern, materials from which the pattern is to be constructed, and kind and type of core boxes; is the foundry to make the pattern or will it have an opportunity of suggesting how it should be made; important dimensions, dimension tolerances and machined surfaces and amount of finish to be allowed; special requirements; description of service or use of casting, whether pound price or piece price is desired and f.o.b.; special crating, marking or packing.

### Other Data Helpful

In addition, for gray iron castings, information should be given regarding special treatment, such as sandblasting, pickling, annealing, heat treating, normalizing, japanning, painting, enameling, polishing, etc. For malleable castings it should be stated if castings are to receive any special finish and if they are to receive any special operations. Information on nonferrous castings should include physical and chemical specifications, determination of royalties to be paid by the foundry and whether the castings are to be treated, machined or receive special treatment for plating, etc.

The cost committee was instructed to consider the report with the National Association of Purchasing agents. Comments made by several men who have devoted considerable work to cost work indicated that the report of the committee is exceptionally complete and covers the ground carefully.

The report of the subcommittee on methods of determining molding costs was presented by W. J. Grede, Liberty Foundry Co., Wauwatosa, Wis., chairman. A questionnaire was sent to a number of foundries in the four branches of the industry, and replies indicated that 66 per cent of those giving the desired information have no system, but depend entirely upon guess. The committee presented two plans, neither of which necessarily is recommended by the committee.

The first plan was covered in a paper "The Point System for Determining Molding Piece Rates" by W. J. MacNeil, superintendent, Federal Malleable Co., Milwaukee. This system consists of determining items involved in making molds, assigning relative values to each item and then setting the rates for individual patterns according to the points involved. It was pointed out that this system is of considerable value when the salesman is called upon to make an estimate of the selling price of a casting in the customer's office.

The second system was covered in a paper "Report on Foundry Price Setting System at the Brown & Sharpe Mfg. Co., Providence, R. I.," which was prepared by Leroy M. Sherwin, foundry and pattern shop superintendent of that company. This system was built up from a large number of time studies taken in that foundry. It is made up of constants and variables. The constants are made in the form of a curve sheet or set of figures which takes cares of all operations which are common to all jobs made on certain squeezer machines, molding machines, bench or floor work.

# Remedies Suggested for Surface Checks Appearing on Malleable Castings

QUESTIONS were raised as to the cause of surface checks which appear periodically on test bars, in the course of discussion at a roundtable luncheon of malleable foundrymen, during the annual meeting of the American Foundrymen's association. Opinion indicated that the checks were cold shuts, and several instances were cited in which the difficulty was overcome by tilting the mold about 1 or 1½ inches from the horizontal, and pouring at the lower end.

Information was asked on the causes of checks in castings which previously had been made satisfactorily. It was suggested that these checks might be due to variations in rates of expansion and contraction of different irons, and in the different sections of the casting. For example, it was mentioned that where a thin section adjoined a heavier one, the thin section may be expanding while the heavy is contracting, which naturally gives rise to stresses.

Another suggestion presented was that the checks might be caused by maintaining too high a dry bond strength in the sand. The sand would not give freely, and would cause a check. By decreasing dry bond strength the trouble would be eliminated. No set rule can be given to determine to what extent the dry bond strength should be decreased, and it was recommended that a cut and try method be applied until the checking was stopped.

### High-Temperature Effects Noted

In discussing the effect of high pouring temperature on shrinkage the general opinion of the malleable foundrymen seemed to be that it caused increased shrinkage and promoted cracking. However, one speaker pointed out that his foundry obtains metal at the spout ranging from 2890 to 2920 degrees Fahr, as determined by an optical pyrometer, and less shrinkage was observed in the metal. A duplex precess employing a cupola and an electric furnace with metal containing between 2.60 and 2.80 per cent carbon was being used.

Inquiry was made on methods of reducing or eliminating scaling in muffle-type annealing furnaces, and whether packing the castings would be of any value. One foundryman stated that when his muffle furnace was being operated at about half its capacity that scaling had been encountered. Different coals and cokes were tried, and the best results were obtained with a finely ground petroleum coke. A question was asked whether it was feasible to apply a magnetic test to determine whether or not small malleable castings are annealed properly. It was stated that experiments had shown that unless the length of the casting was considerably greater than its diameter, magnetic tests were of little value.

### New Refractory Tolerances

New tolerances for fireclay refractories for malleable furnaces were recommended by a committee on refractories, as follows: Standard length, plus or minus 1/16-inch; standard width, plus or minus 1/16-inch; and standard thickness, minus 3/64-inch.

Melting practice came in for major discussion at one of the shop operation coures on malleable iron, the first of their kind to be held. Methods of calculating furnace charges were explained by J. B. Deisher, Columbia Malleable Castings Corp., Columbia, Pa. He stated that the regions of greatest heat in a melting furnace are one-third the distance from the stack end, and one-third the distance from the firing end. The central region between the two points mentioned obtains less heat and consequently charges should be disposed in such a manner as to obtain the most rapid and even melting.

Discussing the duties of molding foremen, William M. Marr, superintendent of foundries, Ohio Brass Co., Mansfield, O., declared that the attributes of leadership include skill in the trade, honesty, ability to understand the problems of others, sound judgment and confidence. It is the duty of the foreman to see that proper and adequate instruction is given to new men and to see that the compensation for work is fair.

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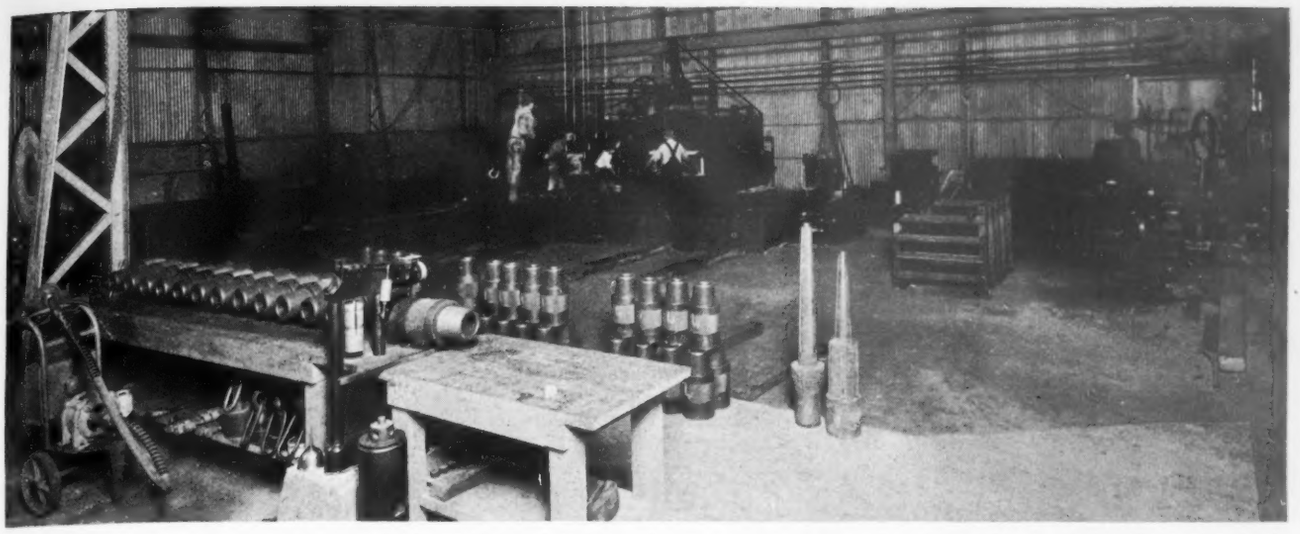
New officers for the Cleveland chapter of the American Society for Steel Treating have been elected as follows: Chairman, W. T. Donkin, metallurgist, Cleveland Wire Spring Co.; vice chairman, W. E. Benninghoff, sales engineer, Cleveland Electric Illuminating Co.; and secretary-treasurer, H. B. Pulsifer, metallurgist, Ferry Cap & Set Screw Co.



*General view of the heat treating facilities with Rockwell hardness tester and a number of tool joints in the foreground. In the central background are the heat treating furnaces and quench tank*

# Oil-Field Tools Must Have Precise Heat Treatment

BY DUDLEY W. MOORE
Editorial Representative, STEEL

IN FEW other lines of industrial equipment are hardness and toughness of steel more essential than in oil-field drilling tools. The difficult and strenuous nature of drilling in hard formations has made heat treating one of the most important operations in the manufacture of these tools.

Hinderliter Tool Co., Tulsa, Okla., in one of the most modern tool manufacturing plants in the Mid-continent field, follows a procedure of heat treating which includes the three fundamentals of manufacturing practice—the selection of the proper grade of steel; careful control of the annealing process to produce strength and hardness; and the machining of the parts as final treatment to insure efficiency of the finished product.

This company manufacturers several hundred different items of drilling equipment, of which rotary and standard cable tool joints and bits are in the majority. These items therefore will be discussed as representative of drilling tool materials in general, since the heat treating method in each case is identical.

Carbon steel is employed widely in the manufacture of drilling tools, though some chrome-nickel alloy steel also is used. The carbon content of steels utilized ranges from about 0.15 per cent in steel for drill stems to 0.80 per cent in steel for tool joints.

Forging is the first step in the manufacturing process after preheating of the parts at low temperature. The rough tools are heated and then straight forged under air hammers, from one to three heatings being necessary. After the final heating the decarburized surface is removed from the parts by grinding, sandblasting and machining operations. At this stage the brinell reading of forgings is approximately 250, depending on the size of pieces and rate of cooling.

### Special Furnace Design

The next step is the normalizing and annealing operation. When first put into the annealing furnace a tool joint of plain carbon steel is heated to a temperature of from 1600 to 1700 degrees Fahr. Drawing temperature is about 1100 degrees Fahr., a low-temperature furnace being used. In the heat treatment of drilling jars a special furnace of the company's own design and construction is employed, this being similar to furnaces used for heat treating gun barrels. It is of a vertical type, cylindrical in shape, 4 feet in diameter and 12 feet deep.

The tool parts receive a thorough normalizing after forging to remove strains incident to forging and rapid cooling. The normalizing produces a soft malleable condition which is readily machinable. The grains are refined partially and the structure is ready for the annealing treatment as a part of the heat treating method. This treatment causes the pearlite and sorbite to change to a structure suitable for machining and it is now ready for testing.

Certain definite heat treating procedures have been developed, the routine treatment for S. A. E. 1040 steel drilling tools being as follows:

| | Degrees Fahr. |
|---|---|
| Normalizing temperature .. | 1600-1700 |
| Heating for oil quench ..... | 1475-1525 |
| Temper or draw heat ..... | 900-1000 |

Similar procedure for alloy steel, S. A. E. 3140 in particular, is as follows:

| | Degrees Fahr. |
|---|---|
| Normalizing temperature .. | 1625-1725 |
| Heating for oil quench ..... | 1500-1550 |
| Temper or draw heat ..... | 1000-1100 |

After being heat treated every piece is tested for hardness on a 12-inch Rockwell-type hardness testing machine. Different readings are required according to the purpose for which the tool is being manufactured. For drilling tools, the average reading ranges from 20 to 36 on the C scale.

The parts are taken to machine shop by traveling crane and machined on engine lathes, being wholly or partially machined according to grade of steel used in their manufacture. It is the practice in this shop in case of carbon steel tool joints to machine the heavier end first, and the light or threaded end in a second operation, to minimize distortion.

When machining is completed the parts are heated again and carried by crane to the oil bath tank and quenched to give maximum strength. The quenching tank, of the company's own design, is 18 feet long, 6 feet

*USING the sandblasting machine to smooth rough surfaces of tool joints after heat treatment. Finished pieces are shown stacked at the right*

wide and 8 feet deep. It is surrounded by a trough filled with water to the depth of the tank and has 2 feet of water underneath, making it in reality a tank of oil inside a tank of water.

In operation, hot oil is pumped through coils surrounded by water and the hot water is carried to a spray pond outside the building for cooling. The pieces to be quenched are placed inside hollow steel cylinders made of 8-inch pipe fitted inside a steel basket swung from a traveling hoist. When lowered into the oil in the quenching process the pieces pass through the cylinder containers to be completely immersed in oil.

For quenching drilling bits two other tanks are provided, one 6 x 8 feet and the other 8 x 8 feet, each 12 feet deep, in which water is circulated in the same manner. Only oil is used here as a quenching medium. The sandblasting and final machining operations follow.

A completely equipped laboratory is maintained for checking analyses of steels and testing formulas for proper heat treatment of various grades of steel. Laboratory tests show that a piece of 0.80 per cent carbon steel after heat treatment has a brinell hardness of about 300 and the required treatment for the shop is therefore between brinell ranges of 280 and 300.

## Standardization Seen as Unemployment Cure

Approval of 46 new national industrial standards including many important projects in the field of mechanical, electrical, civil, mining and chemical engineering, is announced in the *American Standards Year Book* for 1931 which has just been published by the American Standards association. The yearbook proposes that industrial standardization on a nation-wide scale be used by business and industrial leaders as one of the most important means of assuring continuous and in many cases guaranteed employment.

The book contains 102 pages and lists in complete form the many projects adopted as standards, tentative standards, or under consideration by the association.

## British Foundrymen Plan Conference

The twenty-eighth annual conference of the Institute of British Foundrymen will be held in Birmingham and Coventry, June 9-12. Headquarters of the meeting will be in Birmingham, but sessions and social events will take place at Coventry.

The conference will be opened Wednesday, June 10, by F. P. Wilson, president, Pease & Partners Ltd. Technical sessions will take place the mornings of Wednesday and Thursday, June 10 and 11, while the afternoons will be devoted to visits to various plants. Nine papers will be presented at the meeting.

# Corrosion-Resisting Steels Featured at Chemical Industries Exhibit

THE thirteenth National Exposition of Chemical Industries held in New York, May 4-9, was larger in number of exhibitors than any of its predecessors and both attendance and sales interests were reported high. Four hundred and fifty manufacturers had exhibits and the number of visitors averaged close to 15,000 a day. Exhibits occupied three floors of the Grand Central Palace and included nearly all types of machinery used in the chemical industry as well as alloys used in making this machinery and other materials used in various processes.

### Feature Combined Exhibit

Of particular significance was the combined exhibit of the American Sheet & Tin Plate Co., American Steel & Wire Co., Carnegie Steel Co., Illinois Steel Co. and National Tube Co. This is the first time that subsidiaries of the United States Steel Corp. have joined hands under the the common banner of corrosion and heat-resistant steels. The exhibit included nearly all forms of rolled and drawn 18 and 8 steels. Instead of using a trade name for these steels, the designation USS 18-8, USS 18-12, USS 25-12, etc., is used by the Steel corporation.

Bethlehem Steel Corp., Bethlehem, Pa., had an exhibit showing nearly all of its present chrome-nickel alloy products. Its 18 and 8 alloy which is to be known as Bethadur was not featured. The Bethlehem high-temtemperature alloy known as Supertemp and its nonrusting machinable alloy Bethalon were the chief products exhibited. This company announces that it expects to be in production on 18 and 8 sheets within a few months.

### Other Steel Products

John A. Roebling Sons Co., Trenton, N. J., had an elaborate exhibit of woven wire fabrics made of corrosion- resisting steel and other alloys.

Superior Steel Corp., Pittsburgh, exhibited many products made of its rustless iron.

Many uses of nickel-clad steel were exhibited by the Lukens Steel Co., Coatesville, Pa.

A new acid-resisting alloy known as Hastelloy was demonstrated in many products in the booth of the Haynes Stellite Co., Kokomo, Ind.

Other exhibitors in the field of corrosion-resisting steels included Hybnickel Alloys Co., Baltimore; William Powell Co., Cincinnati; Vanadium Corp. of America, New York; Duriron Co. Inc., Dayton, O.; and International Nickel Co. Inc., New York.

# Urges British Steelmakers To Develop High-Grade Steels

CONSIDERABLE difficulty faces the Welsh tin plate industry owing to the fact that a number of countries, which were dependent upon South Wales for their tin plate requirements, now are manufacturing the product, and even competing against South Wales in foreign markets. This fact was brought out at this year's meeting of the British Iron and Steel institute by Sir W. C. Wright, chairman of Baldwin's Ltd., and newly elected president of the society. He traced the technical development of the industry to its present stage and followed with a survey of the economic conditions.

The Bessemer gold medal was presented to Prof. H. Carpenter, Imperial College of Science and Technology, London, and great grandson of Henry Cort, the inventor of the puddling process. The Carnegie gold medal was presented to Dr. E. Valenta, Pilsen, Czecho-Slovakia, and the Williams prize of £100 to Frank Bainbridge, of Saltburn-by-the-sea. The latter prize was awarded to the author of the paper considered as being of the greatest interest presented during the year.

### Time Studies Are Limited

Dr. Ing. Otto Cromberg, Dusseldorf, Germany, pointed out that the main point in endeavoring to obtain the greatest possible economy in iron and steel production is to determine with sufficient exactitude the relationship in time between the workers, the apparatus at disposal, and the material being manufactured, so that the optimum value of the cost of the manufacture can be ascertained. Under the present conditions of trade depression, the interest in time studies with the object of increasing the output is limited only to certain factors, he stated. In a large undertaking where several similar mills are working on the same kind of products, a calculation of the cost of production will decide which mill to keep in operation, but conditions may be such that it may be found advisable to close down certain works altogether.

In the discussion which followed, reference was made to the last-mentioned statement of the author, and it was said that under present conditions, when it is found that the operation of works is uneconomical, it might be said that the whole of the steel industry of Great Britain would have to be shut down. Mention was made that in 1850 time studies were more or less implied in the calculation of the daily output per worker in the foundry trade. It also was pointed out that in 1880 the first use of the stop-watch was made at the Midvale works, Philadelphia, U.S.A., when Taylor originated the methods which have resulted in mass production method in modern times. To-day Germany appears to be in advance of other European countries in the study of efficient methods of production.

Arthur Robinson, the Appleby Iron Co., Ltd., Scunthorpe, Lincolnshire, presented a description of "The Melting Shop of the Appleby Iron Co., Ltd." The process at the Scunthorpe works is carried on in large tilting furnaces, and a semiactive mixer, the equipment being composed of three 250-ton and one 300-ton tilting furnaces, and a semi-active mixer placed centrally between them.

### Develops Interesting Discussion

His address prompted an interesting discussion, which was opened by Fred Clements, Park Gate Iron & Steel Co., Ltd. It often has been stated he said, that the steel industry in Great Britain is behind that of other countries in organization and efficiency, and that the methods of equipment which are being used in America and in Continental countries should be introduced to a larger extent. Britain is handicapped severely, he mentioned, by the fact that the standard of wages is considerably higher than on the Continent, and this situation has to be faced. In the speaker's opinion instead of trying to compete against the Continent in the manufacture of ordinary soft steel, the future of the British steel industry lies in the development of the manufacture of steels of high grade or special quality. He cited the necessity to build ships of larger capacity without increasing the deadweight, and urged British steelmakers to develop a steel which will enable the construction of ships to be effected in that direction. He questioned the advisability of building 300-ton tilting furnaces, to meet the requirements of the manufacturer of steels of special quality.

Benjamin Talbot, Cargo Fleet Iron Co., Ltd., Middlesbrough, referred to the 500-ton mixer used in the Scunthorpe works as a gas-fired preliminary furnace, where the metal goes through a process of refining. He referred to a study published recently in *Stahl und Eisen* which mentioned that it is preferable to leave a good proportion of steel in the furnace instead of practically emptying the furnace altogether.

Replying to the discussion, Mr. Robinson said that high-grade steel or special steels can be manufactured in the large tilting furnace as easily as in the smaller fixed furnace. The limited market for this grade is the only reason for making it in small furnaces, but that when the demand grows, the tilting furnace will be able to manufacture such steels even more cheaply.

The first report of the Corrosion Committee dealing in a large way with field and laboratory corrosion tests of iron and steel was presented by U. R. Evans, Cambridge University, and J. C. Hudson, Birmingham. It is intended to conduct further investigations with respect to the variations of the physical characteristics of samples.

Sir W. J. Larke, director, National Federation of Iron and Steel Manufacturers, mentioned that the work effected by this committee will mark an epoch in the history of the production of iron and steel. Dr. W. Rosenhain emphasized the importance of the physical property test; Dr. W. H. Hatfield, Brown-Firth Research Laboratories, stated that all the steels considered in the investigations of the committee show that corrosion has local effects. He stressed the point that one of the aims of the committee is to show that more numerous uses of mild steel could be made than those made at present.

### Advocate Resumption of Process

Vernon Harbord, London, pointed out that a considerable tonnage of basic-bessemer steel is imported into Great Britain at low prices from the Continent, and suggested that it would be feasible to erect in certain particular parts of England basic-bessemer steel plants, which would enable this grade of steel to be produced at a price that would enable British users to avoid importing this steel from foreign countries.

E. H. Saniter, vice-president of the institute, mentioned that the basic-bessemer process was abandoned in Great Britain several years ago, probably because it did not pay. Referring to certain products which the author of the paper said could be manufactured in basic-bessemer steel, such as tube strip, Mr. Saniter stated that he did not agree that this type of steel is the best for the products mentioned, and he pointed out that in the United States, which country manufactures as much tube strip as the rest of the world put together, all the American strip is made of acid bessemer steel. He further pointed out that the yield in the mill is not as good with basic-bessemer steel as with open-hearth steel. He added that Continental blooms are sold delivered in Great Britain at £3 5s,

and that in his opinion it would be impossible, even manufacturing the steel in this country, to meet that price economically.

J. Henderson, member of the council of the institute, stated that basic-bessemer steel could in some cases be produced at a comparatively low cost, but questioned whether this steel could be marketd easily in Great Britain. If basic bessemer plants are put up in Great Britain, in the opinion of Dr. Hatfield, Sheffield, it would show a tendency to a reversion to ancient and less successful methods than those applied in the country nowadays, and Great Britain should stand, above all, for quality.

**Too Many Open Hearths**

Alfred Hutchinson, vice-president, said that Great Britain already has an excess of open-hearth plants. He questioned whether it would be wise to erect new plants for another process. If the dumping of basic bessemer steel could be stopped, open-hearth steel would have its chance of showing what it can do, and if manufactured in bigger tonnages would go down in price.

In discussing "The Effect of Carbon and Silicon on the Growth and Scaling of Gray Cast-Iron," the authors, Dr. A. L. Norbury and E. Morgan, British Cast Iron Research association, Birmingham, brought out that as the silicon content is increased up to 3 or 4 per cent the growth increases, but with silicon contents over 4 per cent the growth in irons having not too large graphite flakes decreases to a small figure. Irons containing from 4 to 10 per cent silicon in conjunction with graphite in a finely divided condition are being developed commercially by members of the British Cast Iron Research association for growth and scale-resisting purposes, and if properly made give satisfactory results under suitable service conditions. These irons have been protected by British and foreign patents held by the British Cast Iron Research association, and are registered under the name Silal.

Prof. Carpenter mentioned he understood that the scale referred to in the paper is an extreme form of growth. He said there are two types of problem: In the first case, irons are to be submitted to prolonged heat, and in the second case rapidly are taken over a wide range of temperatures. The latter is the more difficult of the two problems. The speaker mentioned that he had used this type of material on furnace structures, and that the results bear out the author's contentions. The parts referred to by the speaker were immune from growth after five months practically continuous use. He suggested that perhaps such irons could be used for making containers for molten metal.

In replying, Dr. Norbury said that these irons are not suitable for ingot molds, because they are too brittle. The metal is only slightly more expensive than commercial iron, but the research association now is building up a more ductile iron, which, on the other hand, would be much more expensive. Irons containing up to about 5 per cent silicon are machined easily; at present they are not exactly suitable for melting pots heated by oil.

# Centrifugal Processes for Casting Iron and Steel Are Improved

TRACKS, cams and other heat resisting parts in furnaces for annealing centrifugally cast iron pipe are made successfully from chrome-nickel alloy; one modern unit designed for this work containing more than 20,000 pounds of the alloy. The rails on which the pipe rolls are made from an alloy containing 28 per cent chromium and 8 per cent nickel, while the cams and other parts are made from 15 per cent chromium and 28 per cent nickel.

These facts were revealed by Dr. F. C. Langenberg and S. B. Clark, research department, United States Cast Iron Pipe & Foundry Co., Burlington, N. J., who reviewed the history of centrifugal casting and pipemaking before several hundred members of the Lehigh Valley, New Jersey, New York and Philadelphia chapters of the American Society for Steel Treating, holding their annual eastern group meeting in Philadelphia, May 15.

The most modern machines for centrifugally casting pipe are more compact and more nearly automatic than former designs. An important part of the process is the annealing which is performed at high temperature, the pipe being taken from the mold at 1000 degrees Fahr. and placed on the rails of the continuous furnace through which it is rolled by means of pushers. According to Mr. Clark, the furnace temperature is maintained evenly and accurately at close to 1700 degrees Fahr., the variation from one side of the furnace to the other being kept under 25 degrees.

Dr. Langenberg told of a new method of casting 3-inch diameter 15 feet long antiaircraft gun barrels at the Watertown, Mass., arsenal. One feature involves the use of a 2-ton high-frequency electric furnace as a ladle, the entire furnace being picked up by a crane for the steel to be poured into the casting machine.

**More Heat Treating Used**

Stating that more than 200,000 tons of cast iron had been heat treated in the past year, Dr. Langenberg pointed out modern foundry practice requires close association with heat treating engineers. Although much is yet to be learned of the theory of heat treating cast iron, he said that his company is engaged actively in research along this line. The ordinary chemical analysis for cast iron furnishes no guide for successful heat treating.

Asked for an opinion, Dr. Langenberg stated that he believed a centrifugally cast steel tube was better than a forged tube, considered from a tangential point of view. When asked if he thought steel plates would some time be made from centrifugally cast billets which would be split and then rolled, he answered negatively, at least not for many years. This method, he said, had been suggested by McConnelly, an associate of Charles M. Schwab in the early days, who actually tried centrifugal casting of so-called doughnuts and then rolling them into bars, but without much success.

In its centrifugal casting, the United States Cast Iron Pipe & Foundry Co. attempts to obtain a surface speed of 1200 feet per minute. One speaker told of having cast successfully by the centrifugal method 18-8 chrome-nickel steel in many commercial forms.

## Makes Wrought Elbows For Welded Piping

In installing welded wrought iron piping systems, the lack of wrought iron elbows has required the use of steel elbows, usually of double extra heavy weight to compensate for difference in life of the two materials. In view of this situation, the Locomotive Terminal Improvement Co., Railway Exchange, Chicago, and A. M. Byers Co., Pittsburgh, jointly announce the development of wrought iron elbows.

These new elbows, known as "Weldells," range in size from 2 to 12 inches and are manufactured with the same radius and center to face measurements as standard radius fittings. In the forging, a tangent is formed on each end, making the elbows interchangeable with standard fittings and the ends are beveled 45 degrees for welding. Stock sizes include both standard and light weight (10-gage) sections. The elbows are forged from wrought iron plate with a smooth, uniform internal diameter and a reinforcing rib along both the outer and inner curvature of radius.

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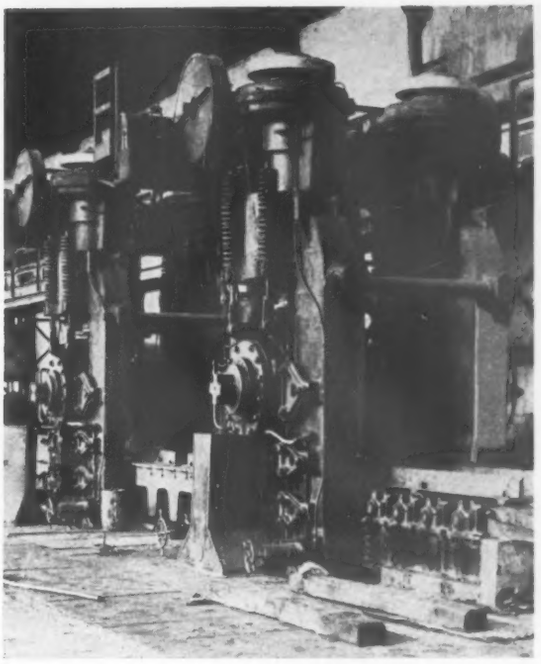

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## Testing Materials Society Announces Program

With announcement of the provisional program, plans for the thirty-fourth annual meeting of the American Society for Testing Materials to be held at the Stevens hotel, Chicago, June 22-26, are nearing completion. Technical sessions are to start on Tuesday morning and will continue through Friday.

One feature of the meeting will be a symposium on effect of temperature on the properties of metals arranged jointly by the society and the American Society of Mechanical Engineers. The Tuesday afternoon and evening sessions are to be devoted to this subject, the first dealing with trends and requirements of the metals and the second on properties of the metals.

**First Exhibit Is Planned**

The society will conduct for the first time an exhibit of testing apparatus and machines, this to be in the exhibition hall of the hotel, starting on Monday. It will close at 9 p.m. on Monday, Tuesday and Thursday; 4 p.m. on Wednesday and 5 p.m. on Friday. Some 21 exhibitors have taken space.

The customary committee reports will be presented at all technical sessions; in addition, many papers are scheduled. Papers listed for the general and metallurgical sessions are as follows:

**Tuesday, June 23**

MORNING

*Reports of Administrative Committees; Nomenclature and Testing*

"Damping Capacity of Materials," by G. S. von Heydekampf.
"The Telemeter and Applications to Dynamic Loading," by F. N. Menefee.
"Methods for Determining the Physical Properties."

AFTERNOON AND EVENING

*Symposium on Effect of Temperature on the Properties of Metals*

Papers to be presented at these sessions were listed on Page 67, May 7 issue of STEEL.

**Wednesday, June 24**

MORNING

*Steel, Wrought Iron, Magnetics*

"The Measurement of Large Brinell Impressions in Steel Rails," by H. H. Morgan and J. R. Mooney.
"Some Physical Properties of Hardened Tool Steel," by J. V. Emmons.
"Thermomagnetic Analysis and the $A_3$ Transformation," by R. L. Sanford and G. A. Ellenger.
"Relation Between Magnetic Properties, Impact Strength and Hardness," by Haakon Styri.
"The Unbalanced Alternating-Current Bridge for Magnetic Analysis—II," by W. B. Kouwenhoven and J. H. Lampe.

AFTERNOON

Sixth Edgar Marburg lecture; "The Phenomenon of Slip in Plastic Materials," by Dr. A. Nadai.

EVENING

Annual address by President K. G. Mackenzie.

**Thursday, June 25**

MORNING

*Corrosion and Fatigue of Metals*

"Oxygen as a Factor in Submerged Corrosion," by E. C. Groesbeck and L. J. Waldron.
"Accelerated Corrosion Tests of Sprayed Molten Metal Coatings in an $SO_2$-$CO_2$ Air Atmosphere," by Leopold Pessel.
"Stress-Corrosion as Influenced by Water Composition," by D. J. McAdam Jr.
"Fatigue Testing of Wire," by S. M. Shelton.
"A 7-Ton 50-Cycle Fatigue Testing Machine," by B. P. Haigh and T. S. Robertson.
"Fatigue Tests of Weld Metal," by R. E. Peterson and C. H. Jennings.
"Endurance Testing of Steel: Comparison of Results Obtained with Rotating Beam Versus Axially Loaded Specimens," by R. D. France.

**Friday, June 26**

AFTERNOON

*Symposium of Malleable Iron Castings*

"Shear Test for Cast Iron," by H. H. Judson.
"Machinability of Malleable Iron Castings," by O. W. Boston.
"Corrosion of Malleable Iron," by F. L. Wolf and L. A. Meisse.

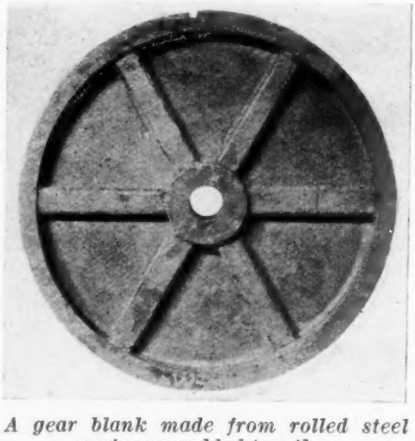
## Develops Gear Blanks of All-Welded Construction

Welded steel blanks, which can be employed in the manufacture of spur, herringbone and helical gears and can be made any size from 24 inches outside diameter up, have been developed by Lukenweld Inc., a division of the Lukens Steel Co., Coatesville, Pa. A blank of this type is shown in the accompanying illustration.

The largest blank made up to the present time is one weighing 4350 pounds. It was 66¾ inches outside diameter, had a face 11¾ inches wide, rim 4⅛ inches thick and the hub diameter of 22½ inches. Ordinarily the blanks are made entirely from S.A.E. 1020 steel, but the rims can be furnished in special analyses.

Hubs are first gas cut from solid rolled steel of thickness to give the desired hub diameters. The webs are gas cut from rolled steel plate, as are the ribs, the latter being formed into channels of required section. The webs are arc welded to the hubs and the reinforcing channels are welded to the web structures. The final operation consists of the circular bending of the gear ring and arc welding it in position to form the finished blank. Welding is performed according to standard practice and all blanks are carefully annealed before shipment.

Advantages of this type of gear are pointed out to be homogeneity of metal, uniformity and soundness of teeth, saving in machining time and increased life of hobs and other gear cutting tools.



*A gear blank made from rolled steel parts arc welded together*

## Gray Iron Institute Work Reviewed in Meeting

More than 100 officers, members and guests attended a special meeting of the Gray Iron institute in Chicago, May 6, arranged in co-operation with the American Foundrymen's association conducting its annual convention during that week. The major portion of the time was spent in the presentation of reports relating to numerous activities of the organization.

The cost committee has arranged to provide general supervision of accounting methods for member companies and cost advisors are working in the various territories making at least two calls a year after proper cost systems are installed. In connection with the technical activities of the institute, Oliver Smalley commented upon the investigation of the elastic properties of gray iron, the proposed advancement of new specifications, the improvement of casting properties of member plants and the interpretation of gray iron and its uses to engineers.

J. H. Bruce, Bowler Foundry Co., Cleveland, illustrated the definite relationship between the technical work now being furthered and merchandising. A distinct accomplishment of the merchandising committee is the recent approval of the Gray Iron institute trade customs by the National Association of Purchasing Agents.

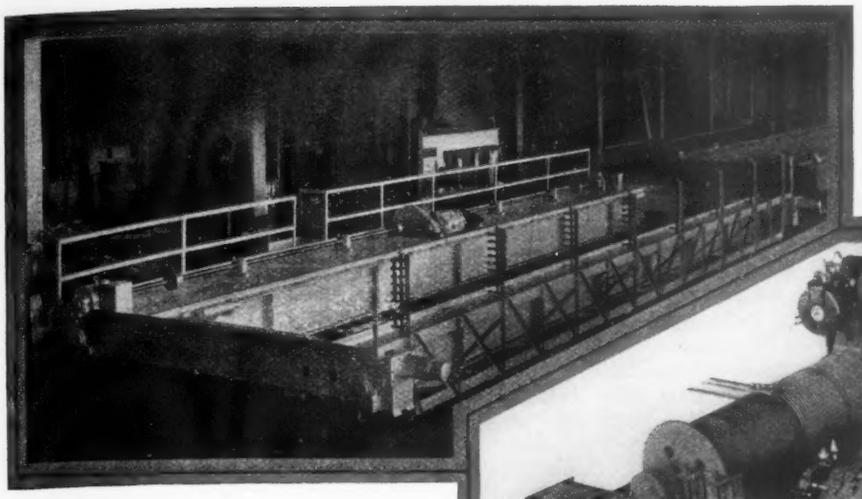
A. J. Tuscany, manager of the institute, summarized and interpreted the work of the various committees and staff personnel. He analyzed this work in relation to the deinfite plan upon which the institute was established.

## Revises Safety Pamphlet

National Safety council, 20 North Wacker drive, Chicago, has completed revision of its Safe Practices Pamphlet No. 41 on Hand Tools. This bulletin, of 8 pages, is confined to a discussion of hand tool accidents in which are involved only simple implements and tools such as axes, wrenches, picks, hammers, hatchets, crowbars, chisels, tongs, etc.

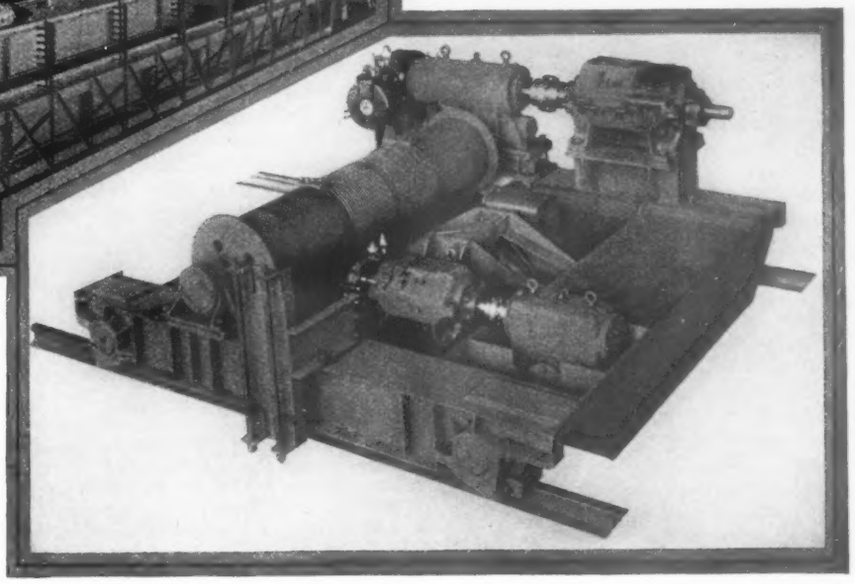
MORGAN ENGINEERING ME MEANS MILL EFFICIENCY

# MORGAN WELDED CRANE



MORGAN 10 TON 58′-3″
SPAN *All-Welded* CRANE

Girders are made up of girder beam sections with welded stiffeners. Auxiliary girders are provided on each side for lateral strength.



10-TON WORM TYPE
*All-Welded* TROLLEY

•

Made up from rolled steel sections—consequently lighter in weight and as stiff and rigid as a one-piece steel casting.

MORGAN Cranes are manufactured for all capacities, for any required span, with one or more hoists, and can be furnished with plain or roller bearings, with worm or spur-gear trolleys, to meet the requirements of the purchaser. Our engineers will gladly assist in solving your crane problems.

*Write for Bulletin No. 31*

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Blooming Mills · Plate Mills
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Steam Hammers

DESIGNERS · MANUFACTURERS · CONTRACTORS

# Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

## Stress-Corrosion Data

*The influence of stress on corrosion, by D. J. McAdam Jr., a paper to be presented at the September* 1931 *meeting of the institute of metals division of the American Institute of Mining and Metallurgical Engineers in Boston,* 39 *pp.,* 14 *illusts,* 4 *tables.*

Special attention is given to nickel, aluminum bronze, corrosion-resisting iron, nitrided steel and Muntz metal. Each corrosion experiment was in two stages: (1) a corrosion stage, in which the specimen was corroded with or without cyclic stress; and (2) a fatigue stage, in which the specimen was tested to fatigue failure and the fatigue limit was estimated. The lowering of the fatigue limit is used as a measure of the damage due to corrosion.

Diagrams of three types are presented, illustrating relative influence of stressless corrosion and corrosion under cyclic stress, in causing damage; illustrating influence of cycle frequency on net damage; and illustrating influence of stress range.

Preliminary data are given to illustrate influence of varying corrosion conditions on the forms of the net-damage diagrams. Influence of varying water composition and oxygen content, and influence of red-lead coating, are discussed.

—STEEL, 5-21-31

## Steel Macrostructure

*Metallographic methods for the macroexamination of steel, used at the Watertown Arsenal, by M. G. Yatsevitch, in Army Ordnance, January-February* 1931, *p .* 297, 9 *pp.,* 10 *illusts.,* 3 *tables.*

Metallographic *macroexamination* has as its purpose the determination of important characteristics, regularities and irregularities of the structure of the metal, which may throw light on its quality; contrary to *microexamination* which presupposes the use of high magnifying power of the microscope, macroexamination usually is limited to characteristics visible to the naked eye or, in extreme cases, under small magnifications. Ordinary magnifying glasses often are used for macroexamination; particularly suitable are binocular microscopes.

Details of macroetching practice are described together with etching reagents, etching time and temperatures. Methods for making Baumann prints, commonly called "sulphur prints" also are outlined.

In general macroetching helps to reveal discontinuities in steel, in other words, its nonhomogeneity. The difference in the action of the reagent on various substances, the agglomeration of which composes the steel, produces the macroetching pattern, the uniformity of which is interrupted by various irregularities. Principal irregularities thus revealed include: Seams, laps, cracks, pipe, blow and pin holes, nonmetallic and metallic segregations, inclusions and dendritic patterns.

—STEEL, 5-21-31

## Brackelsberg Furnace

*Advantages of this process and how they affect the melting and the product, explained by Dr. P. Bardenheuer, in Foundry Trade Journal, April* 23, *p.* 287, 4 *pp.,* 3 *tables,* 10 *illusts.*

In the Brackelsberg furnace the melting conditions are favorable and influence the quality of the metal. When cast iron is melted in this type furnace it becomes a thin liquid, irrespective of its chemical composition. The structure of castings made from it always is dense, there is no tendency to form internal piping. Iron from this furnace has good casting qualities, irrespective of the carbon content and of the chemical composition; furthermore, it can be heated to any desired pouring temperature without difficulty. The author discusses in detail various experiments made to test the possibility of using this type furnace to produce high-test cast iron from fine borings and turnings and cites the results.

—STEEL, 5-21-31

## Cutting Carbides

*Latest developments in milling with tungsten and tantalum carbides discussed by F. W. Curtis, in American Machinist, May* 14, *p.* 755, 3*pp.,* 3 *illusts.*

In many cases it is possible to construct a cutter with solid blades welded to the body. The small steel blade is milled out to receive the tip, which is brazed to it. The body is slotted to receive the blades which are pressed in place. Blades are tack-welded to the body, then the cutter is finished ground. No attempt should be made to equip old cutter bodies with tungsten carbide blades. Every effort should be made to overcome the possibility of blades loosening during cutting. Positive locking is desirable and must at no time be overlooked. Individual clamps or wedges are preferred. The blades should be backed up so that they cannot push away from the cut. Less distortion takes place in milling with tungsten carbide due to higher speeds and reduced cutting pressure. Experience has shown that the rake and clearance angles for tungsten carbide turning tools should be reduced slightly from the conventional angles used for high-speed steel.

—STEEL, 5-21-31

## Modern Casehardening

*Practical applications of casehardening principles in present-day practice, discussed by F. W. Rowe, in Heat Treating and Forging, April* 1931, *p.* 372, 2 *pp.,* 1 *table.*

The correct choice of steel for casehardening depends largely on the character of the stresses to which the part will be subjected. Due to the widely different characteristics of case and core, plain carbon steels are more liable to exfoliation troubles than an alloy steel. With abnormal steels the case will not harden properly and completely on normal quenching, despite its possession of a full carbon content. Steel showing a tendency to abnormality often may be handled successfully by substituting a brine or caustic soda quenching medium for water. Another feature of the plain carbon casehardening steel, which in some instances proves disadvantageous, is that, in order to develop the highest mechanical properties a double quenching operation must take place after carburizing. This frequently results in a large amount of distortion. Thus the employment of a steel which can be treated to give good mechanical properties without heavy distortion, naturally is favored.

—STEEL, 5-21-31

# Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

## Cold Forging Press Has Two Gear Ratios

Toledo Machine & Tool Co., Toledo, O., has developed a new cold forging and stamping press embodying a number of improvements in design. One of these presses is shown in the accompanying illustration.

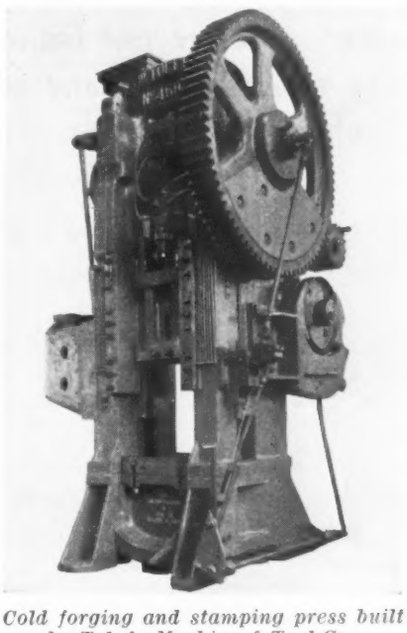
The frame is four-piece, forged steel tie-rod construction. The crankshaft is of the semieccentric type, heat treated to attain maximum strength. The ram will exert a pressure of about 500 tons at the bottom of the stroke. Bearings are bronze bushed at both the frame and connection. The press is double geared with an extra pinion on the driveshaft and an extra gear on the intermediate shaft to give two gear ratios, one of 8 to 1 and the other 20 to 1, thereby operating the press either at 12 or 30 strokes per minute.

The change in the gear ratio is made in a manner similar to that on an automobile. The clutch is of improved multiple-disk friction type, and is mounted in the flywheel on tapered roller bearings. The brake is located at the opposite end of the shaft, thereby eliminating the possibility of heating the clutch through braking friction.

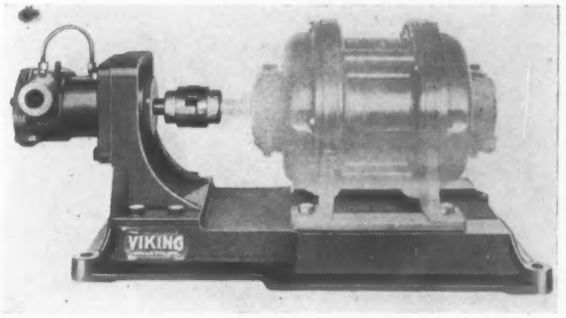
### Clutch Control Improved

The clutch control mechanism has been improved so that the press may be operated either by foot or handlever. A simple adjustment permits the press to be run continuously or stopped automatically at the top center, or stopped instantly at any other point of the stroke, this last feature being particularly desirable when setting dies. A cam actuated lower liftout is furnished for raising the work from the die after operations have been performed. The driveshaft runs on tapered roller bearings, and centralized forced feed lubrication is provided to all main bearings.

The slide is 24 x 26½ inches, the bed is 32 x 33 inches, stroke is 12 inches, and distance from top of bolster to underface of slide, stroke down and adjustment up, is 28 inches. Any of these dimensions can be changed easily to suit special conditions. Drive is by a 30-horsepower motor, belted to the flywheel. This press, which weighs about 85,000 pounds, is particularly recommended for extruding valve heads, coining covers on globe valves, and other forging, forming or stamping within its capacity.



*Cold forging and stamping press built by Toledo Machine & Tool Co.*




*High pressure pumping unit developed by Viking Pump Co. for use with hydraulically operated machinery. An unusual rotary principle is embodied in this design*

◆

## Unique Principle Applied in Hydraulic Units

Viking Pump Co., Cedar Falls, Iowa, announces a new line of rotary pumps for hydraulic operation of elevators, presses, machine tools, etc. One of these pumps, mounted on a base with its motor as a self contained unit, is shown in the accompanying illustration.

These pumps are designed with opposite ports, and as they will operate equally well in either direction, the necessity of building both right and left hand models is avoided. The casing is of strong cast iron having nickel content. Off center within the case is a star wheel, or rotor, which drives an internal gear, or idler, running on the bore of the casing. The space between the ends of the teeth of rotor and idler due to the eccentric location of the idler shaft in the case is filled by a stationary member which is crescent shaped.

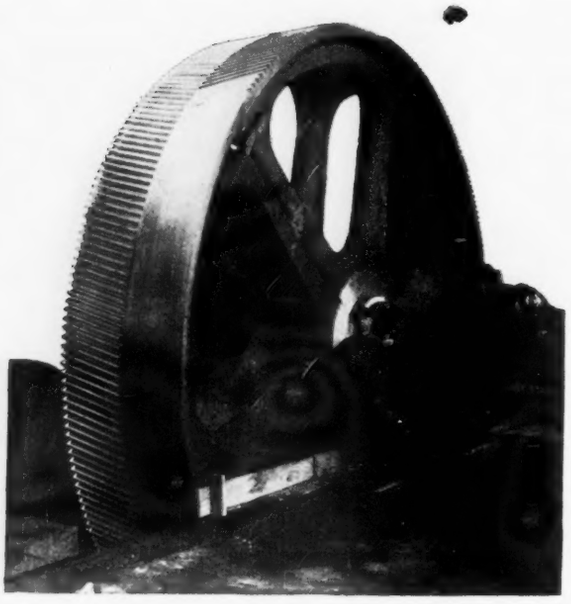
During the short interval between the ports, the meshing teeth of rotor and idler almost completely fill each others spaces, but as the intake port is passed the teeth draw apart, creating suction. The liquid which is drawn in as a result of this, is carried around the long interval, being retained in the tooth spaces by the crescent shaped member. As the outlet port is approached the teeth remesh and the liquid is squeezed out through that port.

### Built in Six Capacities

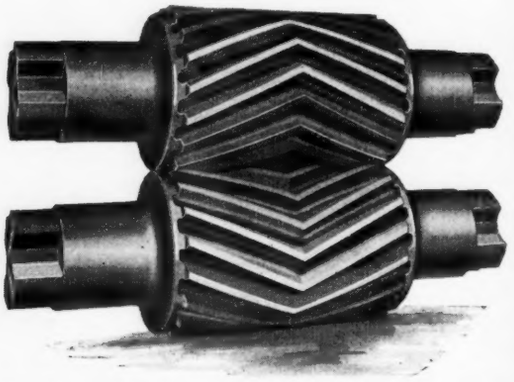
The rotor is of strong aluminum bronze and the idler is of case hardened steel, its shaft being mounted on roller bearings. Six models of the pump are available, with capacities ranging from 5 to 45 gallons per minute at 1200 revolutions per minute. They will give pressures up to 500 pounds per square inch. The highest mechanical efficiency, this ranging from 50 to 80 per cent, according to size of pump, is attained at 200

# MACKINTOSH-HEMPHILL

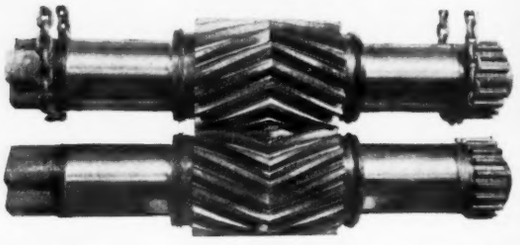
"THE BEST IN ROLLING MILL MACHINERY"



DOUBLE HELICAL GEAR
23' Diameter, 54" Face, Weight 72 Tons



ROLLING MILL PINIONS WITH SOLID APEX AND INTEGRAL SHROUDS
7" C. P. 58" Face, Weight 17 Tons Each



ROLLING MILL PINIONS WITH SOLID APEX
10" C. P. 72" Face, Weight 55 Tons Each

Our method of cutting gears is individual with ourselves. We are not limited in our gear-cutting equipment to any standard of pitch and angle.

*Double helical gears and pinions are cut with solid apex and integral shrouds if specified*

## MACKINTOSH-HEMPHILL CO.

ESTABLISHED 1803 AT PITTSBURGH

General Offices:
Point Building, Penn Avenue at Water Street
**PITTSBURGH, PA.**

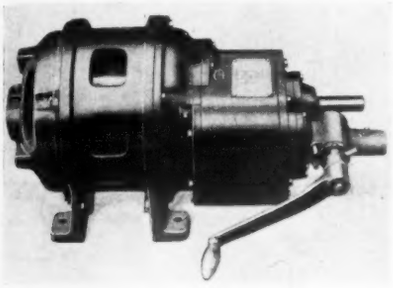
| Garrison Division | Midland Division | Wooster Division |
|---|---|---|
| PITTSBURGH, PA. | MIDLAND, PA. | WOOSTER, OHIO |

pounds per square inch, as shown by tests. Capacity remains uniform under varying heads. With the exception of the 5 gallon model, all have identical flanges and hubs, making them interchangeable.

◆

## Motor and Gear Unit Gives Four Changes of Speed

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed a power unit consisting of a multi-speed reduction gear combined with a standard alternating-current motor. Constructed to give four different speeds to the output shaft at constant horsepower, this unit is applicable to many industrial operations which for efficient performance require more than one speed. With this unit, one of which is shown in the accompanying illustration, the speed of the driven apparatus may be changed instantly while the motor is running at full speed and under full load. All gears constantly are in mesh, and it is impossible for the operator to injure the unit by changing speeds at any time.



*Multiple speed power and gear unit developed by Westinghouse*

### Details of Mechanism

The gear unit is mounted on a standard squirrel-cage induction motor. A pinion mounted on the motor shaft drives a gear mounted on the countershaft. Also on the countershaft are four idling ring gears which constantly are in mesh with four gears pressed on the output shaft. The bore of each countershaft gear contains an internal clutch. Each of these clutches is actuated by two tapered wedges which are forced between the clutch halves by a spring member. To bring this member to the correct position for a desired speed, the control handle, which is provided with a spur pinion, is rotated, thereby actuating a rack which is mounted on the spring member. This movement brings the spring member between the tapered wedges and provides pressure for clutching any one of the four ring gears to the countershaft, which in turn, drives the output shaft at desired speed. Between each speed setting is a neutral position, and to disengage a clutch and bring it into a neutral position, it is necessary only to rotate the handle so as to bring the spring member into a position which does not contact the expanding wedges. A further movement of the handle brings the spring member into contact with the next set of expanding wedges and clutches the next gear to the countershaft.

Therefore, it not only is possible to make speed changes under full load, but also the apparatus can be stopped or started in that condition. Ball bearings are used in both motor and gear units and gearing in the first reduction, or drive from the motor to countershaft, is of the single helical type which insures quietness of operation. Splash system of lubrication is provided.

◆

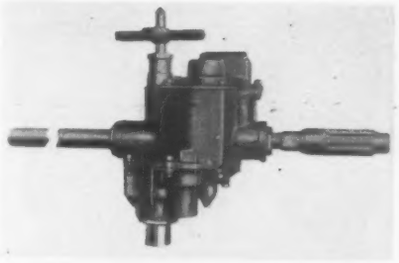
## Light Air Operated Drill Has Vane-Type Motor

Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, announces a pneumatic rotary drill featuring light weight. This tool does drilling and reaming, particularly in close quarters. One of these tools is shown in the accompanying illustration.

The motor is of the power vane type, employing no pistons, toggles or crankshafts. The maker claims for this motor more power per unit weight, and smoother operation than with ordinary rotary air motors. A hardened steel cylinder liner is used which can be replaced readily. Through-bolt construction gives strength and easy replacement of parts. Antifriction bearings are used throughout and complete lubrication for the motor is effected by a line oiler located in the housing. Adjustable grease fittings are located on the gear and governor cases.

### Governor Control

Governor control on intake air supply maintains free speed, as well as reducing air consumption on the power side and back pressure on the exhaust side. Governor controlled light speeds prevent wear and breakage of taps, drills and reamer bits. To eliminate annoying noise and blast of the exhaust, a deflector and muffler are provided. A small spindle offset permits operation in comparatively close quarters.



*Light air-driven close quarters drill built by Chicago Pneumatic Tool Co.*

The tool has a net weight of 35 pounds, overall length of 14¾ inches, feed length of 4½ inches and spindle offset of 2 5/16 inches. It has a free speed of 300 revolutions per minute, will perform drilling operations up to 1½ inches in diameter, and reaming operations up to 1⅛ inches diameter.

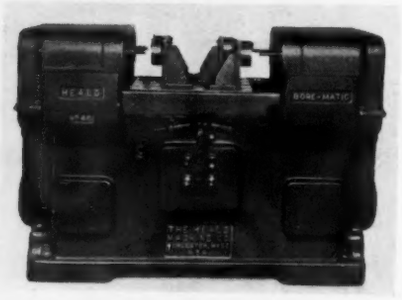
◆

## Pneumatic Riveters Are of Roller Wedge Design

Norin Engineering Co., 355 North Union Park court, Chicago, has designed a new line of high-speed air operated pressure riveters suitable for use with either 80 or 100 pounds air pressure. One of these machines, together with its foot-operated valve, is shown in the accompanying illustration.

These riveters, which require but

*Norin pneumatic riveter requiring only one stroke per rivet*



*Heald bore finishing machine uses diamond or tungsten carbide tools*

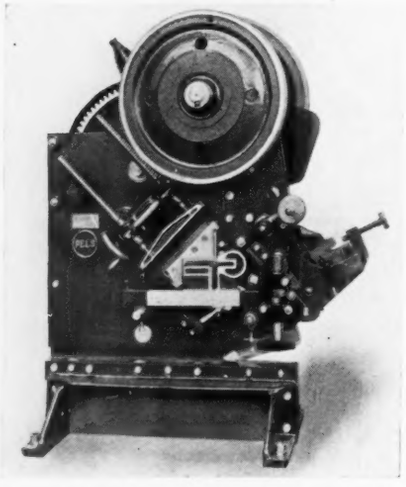
one stroke per rivet, feature the roller wedge principle of operation, the plunger having relatively rapid motion at the beginning of its working stroke, this speed decreasing as the pressure increases. Toward the end of the stroke uniform pressure is maintained, enabling rivets to be driven through various thicknesses of material without requiring die adjustment.

The complete line includes capacities from 9-inch reach and 9-inch gap to 48-inch reach and 24-inch gap. Various arrangements of the head are provided to suit the work and forged stakes can be provided in place of the usual cast type in cases where it is necessary to reach rivets in restricted spaces, where ordinarily they must be driven by hand. These machines also can be used effectively for punching.

◆

## Shear Is Built for Use in Welding Departments

Henry Pels & Co., 90 West street, New York, has put on the market a newly designed machine in two sizes for cutting angles, tees, round, square and flat bars, plates, and also for notching or coping. These machines, one of which is shown in the accompanying illustration, do not perform punching operations, as they have been designed primarily for use in shops where welding has been substituted for riveting.



*New Pels shear designed for use in plants where welding is done*

Apart from the omission of the punch mechanism, the design, operation and capacities of these machines correspond to the two smaller sizes of the combination shears and punches made by this company and described in previous issues of STEEL. The smaller size will shear ½-inch plate of any width, while the larger one will shear ⅝-inch plate. The frames are of the guaranteed unbreakable steel plate construction featured by this company for more than 30 years.

◆

## Machine Finishes Holes by Precision Boring

Heald Machine Co., Worcester, Mass., announces a precision hole finishing machine of the double-end type, which operates on the boring principle, using single point diamond or tungsten carbide tools. The machine is shown in the accompanying illustration.

To insure the rigidity necessary to attain precision results under production conditions, the machine is heavy, has low center of gravity, and is built to close limits. Hydraulic feed gives smoothness of operation and flexibility of control which the maker believes can be attained by no other means.

The one-piece base is a box-type semisteel casting, weighing approximately 3300 pounds. It has thick walls, liberal ribbing, and stable three-point bearings on its foundation. One V and one flat way carry the table, which is a solid casting weighing about 850 pounds. This is reciprocated by a hydraulic system similar to that used on Heald internal grinders, giving table feeds ranging from ½ to 15 inches per minute, with shockless reversal.

### Centralized Control

A hydraulic control box with all controls concentrated on its exterior panel, is located at convenient operating position on the front of the machine. Valves within this box govern every function of the machine except starting and stopping of the driving motor and loading and unloading of work in the fixtures.

The machine will bore holes ranging from 5/16 to 5 inches in diameter, up to maximum length of 7 inches. Distance from top of table to center line of standard spindles is 7 inches, minimum distance between these spindles is 5 inches, and maximum distance between spindles is 13 inches. The base is 33½ x 67½ inches and the net weight of the machine is about 6300 pounds.

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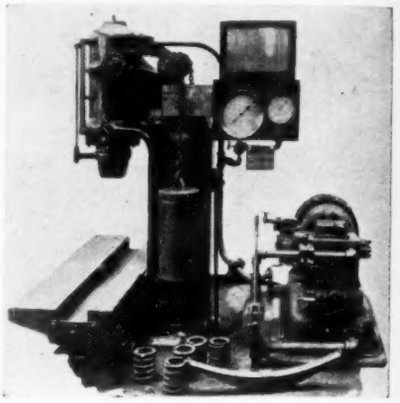
## Hydraulic Machine Tests Railroad Springs

Joseph T. Ryerson & Son Inc., Sixteenth and Rockwell streets, Chicago, recently designed a hydraulic machine for testing railroad springs.



*Hydraulic machine built by Ryerson for testing railroad springs*

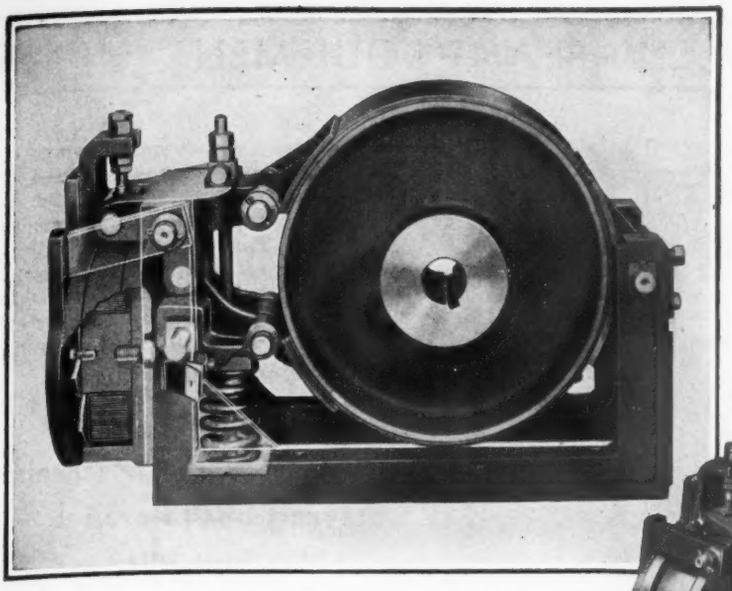
This machine is shown in the accompanying illustration.

Oil pressure is generated by a motor-driven hydraulic unit built by the Oilgear Co., this being mounted on the frame of the machine so as to require only minimum floor space. The frame has an 11-inch throat and the work table is 25 inches wide, both frame and work table being of cast steel to withstand the heavy strains which testing pressures impose upon them.

### Scope and Nature of Tests

All types of railway springs can be tested, including full-elliptic passenger car springs, semi-elliptic locomotive springs and coil springs. A scale is mounted on the overhead ram cylinder, and as the spring is deflected by downward movement of the ram, the exact amount of deflection is indicated on this scale by a moving pointer. At the same time, a large gage indicates both pressure in pounds per square inch and total ram pressure in pounds. A spring can be held in deflection at any desired

# G-E Band-Type Magnetic Brake



*Phantom view of G-E CR9517 magnetic brake. Note minimum adjustments and simple construction*

*G-E CR9517 magnetic brake mounted to show operating position*

## It stands the severest service on your mill auxiliaries, cranes, and hoists

POWER to grip and hold — powerfully built of welded bar stock — easily adjusted — weatherproof.

Low pressure — approximately 15 to 18 pounds per square inch for a 30-minute rating — minimizes wear on brake lining and wheel.

Coil terminals are secured to the magnet frame. Coil magnet — easily replaced without changing brake adjustment — is so mounted that terminals can be brought out either side of brake.

Brake bands are interchangeable, top and bottom.

Balanced rolled-steel wheels can be raised vertically with top band thrown back.

Coils are form-wound, vacuum-treated, and compounded in the magnet frame.

These are the outstanding features of the new G-E CR9517 d-c. band-type magnetic brakes. Write your nearest G-E office for descriptive bulletin GEA-1296A containing complete information.

JOIN US IN THE GENERAL ELECTRIC PROGRAM, BROADCAST EVERY SATURDAY EVENING ON A NATION-WIDE N.B.C. NETWORK

301-73

GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

pressure for three or four minutes. Maximum ram pressure of 50 tons is developed by the peak pump capacity of 1500 pounds per square inch.

◆

## Coolant Pump for Grinders Is of Vertical Type

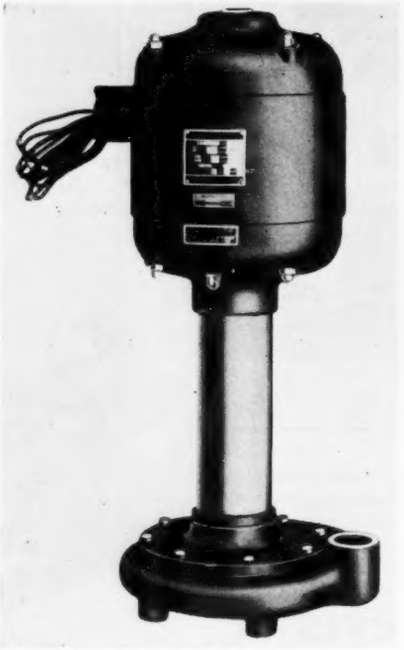
Ruthman Machinery Co., Cincinnati, has put on the market a new type of vertical, ball bearing equipped motor-driven pump for the circulation of coolant on grinding machines. This pump unit, one of which is shown in the accompanying illustration, will give a continuous flow of 120 gallons per minute.

The motor, direct connected to the pump, is of 2-horsepower capacity and runs at 1725 revolutions per minute. The rotor shaft is supported by two heavy-duty ball bearings and extends into the pump housing, forming the impeller shaft. This shaft is of large diameter to insure rigidity and prevent vibration. The pumping action is performed by one revolving part known as the impeller, this being designed to avoid clogging by abrasive material, chips and other solids in the water or compound.

**Improved Strainer**

An intake strainer is integral with the base casting. Openings of this strainer are large enough to allow free passage of the liquid, but at the same time are small enough to prevent large pieces of waste, rags, abrasive material, etc. from entering the pump intake. The pump requires no packing, no felt washers, nor close fits of any part coming into contact with the grinding compound. Ample clearance is allowed between the impeller and housing to permit foreign bodies of reasonable size to pass through freely.

The upper end bell or motor bearing flange is totally enclosed, thereby preventing dirt, dripping, etc., from getting into the motor. Motor leads project through a conduit box mounted on the side of the motor frame, which is a safety feature. The pump can be furnished either for immersed or outside installations, also in several sizes ranging from ¼ to 5 horsepower.



*Vertical motor driven coolant pump built by Ruthman Machinery Co.*

◆

## Constant Level Oil Feeder Controls Lubrication

Daun-Walter Co., announces a line of constant level oil controls for regulation of lubrication of machine bearings and ways. The accompanying illustration shows one of these controls mounted in operating position.

The essential parts are: A main reservoir with filler cap and oil height gage; a supporting bracket; and a threaded lower extension for oil lead connection. It is claimed that this device will replace the exact amount of oil used by a bearing; when and as it is used, this section being based on equalization of gravity and atmospheric pressure. Delivery of oil is controlled automatically without the use of floats, springs or valves, oil level being easily and permanently regulated by adjusting the attaching bracket which may be seen in the illustration.

Oil may be piped direct from the device in any horizontal direction to feed one or several bearings on the same level, and when used in connection with the Daun-Walter adjustable wick unit, which was described on Page 53 of April 30, 1931, STEEL, one or several bearings on different levels can be fed accurately. These constant level oil controls are made with reservoir capacities ranging from ½ to 2 gallons.

*Daun-Walter constant level oiler for regulating bearing lubrication*

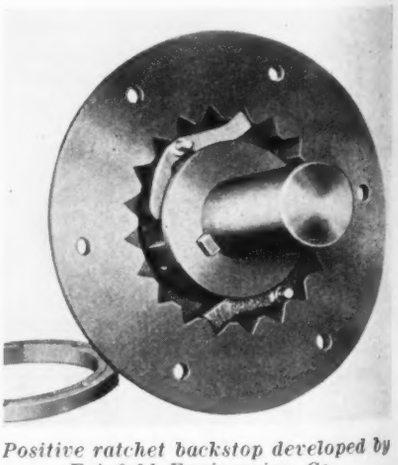
◆

## Compact Ratchet Mechanism Prevents Shaft Reversal

Fairfield Engineering Co., Marion, O., has developed a device which positively prevents shaft reversal. It is automatic in action and operates instantaneously and silently. One of these backstops, with casing open to reveal its mechanism, is shown in the accompanying illustration.

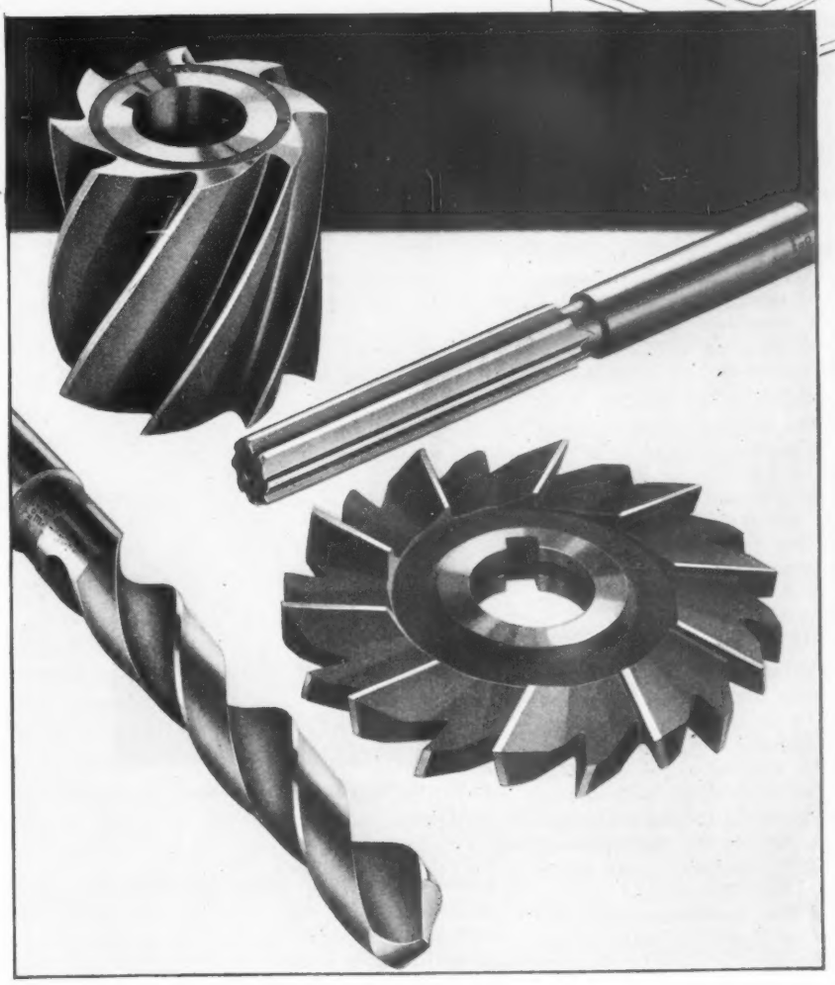
The internal parts consist of two locking pawls mounted on pins held by two floating rings and a pawl collar. All of these parts rotate as a unit, through engagement of the pawls and pawl collar. This collar is designed so that the pawls do not engage the ratchet while the shaft is turning in the desired direction, but instantly do lock into the ratchet upon reversal of the shaft. The collar is fastened to the shaft by key and set screw, while the floating rings are free to rotate with pawls and pawl collar. The sealed housing allows complete oil bath lubrication.

No extra shaft space is required, this device being designed to take the place of a standard shaft bearing. It also eliminates end thrust in either direction. Two types are furnished, one designed for face mounting and the other for side mounting on machine frames.



*Positive ratchet backstop developed by Fairfield Engineering Co.*

# Both of You *are looking for the same thing*



*The Morse Line includes High Speed and Carbon*

- DRILLS
- REAMERS
- CUTTERS
- TAPS AND DIES
- SCREW PLATES
- ARBORS
- CHUCKS
- COUNTERBORES
- MANDRELS
- TAPER PINS
- SOCKETS
- SLEEVES

IN THE SHOP or in the office you men who select small tools are looking for the same thing — PRODUCTION.

In MORSE Tools you will find what you are looking for. Their long life between sharpenings will make an immediate and lasting improvement in your production figures.

**MORSE**

**TWIST DRILL & MACHINE COMPANY**

NEW BEDFORD, MASS., U.S.A.

# Personals

(*Concluded from Page* 30)

dent; E. A. McKelvy, vice president, and Roger A. Hitchins, secretary-treasurer. All other officers were re-elected.

Mr. Sproul in addition to being president and director of General Refractories Co., also is director of Delaware County National bank, Lehigh Valley railroad, Philadelphia, Baltimore & Washington railroad, and is vice president and director of Lackawanna & Wyoming Valley railroad.

□ □ □

Harry C. Davis has resigned as superintendent of the sheet plant, Mahoning Valley Steel Co., Niles, O. He has filled that position since 1922.

□ □ □

R. H. Crevoisie, who recently was assistant chief engineer of Republic Steel Corp., Youngstown, O., has become plant engineer at the new wrought iron plant at Economy, Pa., of the A. M. Byers Co., Pittsburgh.

□ □ □

R. B. Miller, for many years identified with Hickman, Williams & Co. Inc., dealer in pig iron, coke and alloys, has retired and will reside in Pittsburgh. Mr. Miller had been connected with the company's Cincinnati office since 1906, having been identified previously with Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

□ □ □

Clay P. Hellwig, who was connected with the Cleveland office of Rogers Brown & Crocker Bros. Inc. and its predecessor for 15 years and who recently was manager of both Cleveland and Pittsburgh territories, has been appointed Cleveland district manager of Kerchner, Marshall & Co., Pittsburgh, dealers in pig iron, coal, coke, ferromanganese, ferroalloys, etc. His headquarters from June 1 will be 627 Union Trust building, Cleveland.

□ □ □

Samuel Fassler, president, Fassler Iron Works, 439 East Tenth street, New York, has been appointed Manhattan's superintendent of buildings. Mr. Fassler is president of the Allied Building Metal Industries, head of the Employers' Association of Architectural Iron Workers and chairman of the National Association of Ornamental Bronze Manufacturers.

□ □ □

E. H. Mebs, who has been metallurgist at the Watertown arsenal of the United States government, has been appointed chief metallurgist of Ohio Steel Foundry Co., Lima, O., in connection with all company products, particularly in the manufacture of steel and alloy rolls. He was graduated in metallurgical engineering from Ohio State university in 1921 and took post graduate work in metallurgical engineering at the university of Alabama in 1922. He was identified with Wheeling Mold & Foundry Co., Wheeling, W. Va., for about eight years in a metallurgical capacity, the last two years discharging the duties of assistant general superintendent. He then went to Watertown arsenal.

□ □ □

T. Holland Nelson, consulting metallurgist, Midvale Co., Philadelphia, will speak on "Corrosion Resistant Alloys of the Stainless Type in Use and Fabrication," before the American Iron and Steel institute at New York, May 22. After experience gained with Thomas Firth & Sons Ltd., Brown-Firth Research Laboratory and Darwin & Milner, all of

**T. Holland Nelson**

Sheffield, England, he came to America in 1911. He became metallurgist for Simonds Mfg. Co., Lockport, N. Y., then steel works superintendent, Henry Disston & Sons, Philadelphia. During the World war he was tool steel works manager and then managing director, Peter Stubs Ltd., Rotherham, England, making munitions. In 1920 he rejoined Henry Disston & Sons Inc. as production manager. He next became consultant on corrosion and heat resistant alloys for United Alloy Steel Corp., Canton, O., and after its merger with Central Alloy Steel Co. became consulting metallurgist for Ludlum Steel Co., Watervliet, N. Y. He since has been associated with most large chromium iron installations in America. For some time past he has been consulting metallurgist for the Midvale Co.

□ □ □

Cyril Ainsworth, in charge of American Standards association safety code work during the past year, was recently appointed assistant secretary. He succeeds F. J. Schlink, who held that office for the past eight years but who recently resigned to give full time to the technical direction of Consumers' Research Inc.

F. M. Farmer, representing American Institute of Electrical Engineers and the American Welding society, has been appointed chairman of the American Standards association's sectional committee on electric welding apparatus.

□ □ □

J. K. Aimer has been made assistant general manager of sales at New York for Reading Iron Co., Reading, Pa. W. S. Shiffer has been appointed assistant to the general manager of sales, Reading.

R. I. Fretz, of the Reading district, now is in charge at Pittsburgh. He succeeds Wyman Howells, who was transferred to Reading territory.

Other appointments follow: Harry L. Bialock at St. Louis; L. C. Hartzell at Reading, in charge of promotion of nipple business; George D. Smith, railroad material salesman at New York; and E. S. Moorehead at Pittsburgh.

□ □ □

Francis Hodgkinson, consulting mechanical engineer at the South Philadelphia, Pa., works of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been awarded a gold medal, the Willans premium, distinguished British engineering honor, by the Institution of Mechanical Engineers of London, England. Mr. Hodgkinson's paper, "Journal Bearing Practice" was considered the best published in the society's proceedings from 1925 to 1930, inclusive. He has been with the Westinghouse organization since 1896, was made chief engineer at South Philadelphia works in 1916 and ten years later was appointed consulting mechanical engineer for all Westinghouse branches, with headquarters at South Philadelphia.

□ □ □

O. C. Davidson, Iron Mountain, Mich., general superintendent of Oliver Iron Mining Co., Duluth, in charge of Menominee and Gogebic iron ranges in Michigan, retired April 30 on the United States Steel Corp.'s new retirement plan, having reached the age limit with 34 years of service to his credit.

D. E. Sutherland, Ironwood, Mich., assistant general superintendent on the Gogebic iron range, retired April 30, after having worked for 51 years for the Oliver company or companies affilated with it.

George J. Eisele, Iron Mountain, Mich., assistant general superintendend on the Menominee iron range, will be in charge of the company's mines in that division of the Lake Superior district.

Henry Rowe, Ironwood, Mich., assistant superintendent of Gogebic range mines will be in charge of that area, effective May 1.

# Steel Operations Continue Decline

## Down 3 Points to 44 Per Cent, as Automotive Industry Passes Spring Peak—Structural, Pipe Demands Are Fairly Active—Composite Price Holds

FURTHER deterioration in demand, cutting across the entire steel consumption structure, is manifest in declining requirements and a reduction of 3 points in steelmaking operations, bringing the rate this week down to 44 per cent.

Automobile production apparently passed its spring peak and turned down moderately in the past week. Assembly is definitely lower; current steel requirements reflect this phase. Not having had a sharp rise in the spring, it is believed the automotive industry—like steel—will not experience an abrupt reduction, but rather a slowly subsiding trend.

Building construction continues moderately active. Considerable railroad bridge and grade crossing elimination work is developing, indicating that some of the government's programs for stimulating these activities are having an effect. New structural steel inquiry amounts to 47,473 tons, not including nearly 60,000 tons for a bridge at New Orleans, action on which has been deferred. Included, however, is 30,000 tons for a bridge at Henderson, Ky. The majority of structural jobs are small.

Structural awards this week total 19,253 tons, compared with 18,677 tons in the week preceding, and 34,180 tons in the week a year ago. To date this year structural awards amount to 819,519 tons, well ahead of the 735,224 tons placed in the comparable period last year.

Steel pipe demand is a little more active, with 26,700 tons purchased in the week, and 15,000 tons pending. A Pittsburgh mill has booked 20,000 tons for a Sun Pipe Line Co. project in Texas. Hackensack, N. J., placed 6500 tons. A moderate amount of business has been closed quietly. The Lycoming Natural Gas Co. is in the market for 15,000 tons. Mahoning valley producers look for more substantial pipe orders shortly when financing is completed.

Railroads continue to take a heavy tonnage of track fastenings in keeping up track maintenance work. But Chicago mill interests are discouraged over the lack of prospects for secondary rail buying, and continued deferment of rolling stock maintenance work. The impression prevails that a good deal of such work is being postponed unnecessarily at an auspicious time, tending to pile up repairs in a period when prices will be less advantageous to the roads. Six thousand tons of steel is being placed at Chicago for 500 Northern Pacific underframes.

Demand for wire is quieter as the fencing season passes. Releases for plates and bars are slackening. A number of East Texas oil tank projects, requiring 50,000 tons of plates, are hanging fire pending decision on a pro-rata plan. At Pittsburgh 15 tank barges are up for figures, requiring 4000 tons of plates. Strip and sheet specifications have eased off.

STEEL'S composite of 14 leading iron and steel products is unchanged at $31.37 this week, for the first time in six weeks. Declining demand for automotive steel makes prices more susceptible to concessions, but thus far business is insufficient to tempt producers. Strip manufacturers are attempting to firm up their prices, but the market lacks a test.

Plates, shapes and bars in eastern markets are weaker, and a decline from the 1.65c, Pittsburgh, level is expected. Wire and nails are being shaded, with 2.20c, Pittsburgh, becoming the market on wire. Semifinished steel is easier.

Prices of the higher finishes of sheets appear to be holding relatively better than those of the common grades. Acceptance of the new sheet classifications by mill interests is more general, and since they provide for price advances if adhered to strictly, consumers with second quarter contracts are expected to specify generously before July.

In only three of the seven major iron and steel producing districts are operations unchanged this week, all others showing declines. Cleveland holds at 59, Pittsburgh at 45 and Buffalo at 54. Eastern Pennsylvania is down 5 points to 38 per cent; Birmingham, off 5 points to 60 per cent; Youngstown, down 1 to 41; and Chicago, down 1½ to 45-48.

## Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

| | |
|---|---|
| **This week (May 20, 1931)** | **$31.37** |
| **Last week (May 13, 1931)** | **31.37** |
| **One month ago (April, 1931)** | **31.59** |
| **Three months ago (February, 1931)** | **31.65** |
| **One year ago (May, 1930)** | **33.73** |
| **Ten years ago (May, 1921)** | **43.32** |

# Comparative Prices of Iron, Steel and Coke

**Representative Market Figures for This Week, Last Month, Three Months and One Year Ago**

| | May 20, 1931 | April 1931 | Feb. 1931 | May 1930 |
|---|---|---|---|---|
| **PIG IRON** | | | | |
| Bessemer, del. Pittsburgh | $18.26 | 18.26 | 18.51 | 20.76 |
| Basic, valley | 17.00 | 17.00 | 16.75 | 18.50 |
| Basic, eastern del. eastern Pa. | 17.00 | 17.25 | 17.25 | 18.75 |
| No. 2 foundry, del. Pittsburgh | 18.26 | 18.26 | 18.01 | 19.76 |
| No. 2 foundry, Chicago | 17.50 | 17.50 | 17.50 | 19.00 |
| *Southern No. 2, Birmingham | 12.00 | 13.00 | 13.00 | 14.00 |
| **No. 2X, Virginia furnace | 18.25 | 18.25 | 18.25 | 18.25 |
| **No. 2X, Eastern del., Phila. | 17.76 | 18.26 | 18.26 | 20.26 |
| Malleable, valley | 17.00 | 17.00 | 17.25 | 19.00 |
| Malleable, Chicago | 17.50 | 17.50 | 17.50 | 19.00 |
| Lake Superior, charcoal, del. Chi. | 27.04 | 27.04 | 27.04 | 27.04 |
| Gray forge, del. Pittsburgh | 17.63 | 17.63 | 17.38 | 19.13 |
| Ferromanganese, del. Pittsburgh | 89.79 | 89.79 | 89.79 | 103.79 |

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $11, Birmingham. **2.25 to 2.75 silicon.

| | | | | |
|---|---|---|---|---|
| **COKE** | | | | |
| Connellsville furnace, ovens | 2.40 | 2.50 | 2.50 | 2.55 |
| Connellsville foundry, ovens | 3.25 | 3.25 | 3.25 | 3.50 |
| **SEMIFINISHED MATERIAL** | | | | |
| Sheet bars, open-hearth, Youngs. | 30.00 | 30.00 | 30.00 | 32.20 |
| Sheet bars, open-hearth, Pitts. | 30.00 | 30.00 | 30.00 | 32.20 |
| Billets, open-hearth, Pittsburgh | 30.00 | 30.00 | 30.00 | 32.20 |
| Wire rods, Pittsburgh | 35.00 | 36.00 | 35.00 | 36.40 |

| | May 20, 1931 | April 1931 | Feb. 1931 | May 1930 |
|---|---|---|---|---|
| **FINISHED MATERIAL** | | | | |
| Steel bars, Pittsburgh | 1.65 | 1.65 | 1.65 | 1.76 |
| Steel bars, Chicago | 1.75 | 1.80 | 1.70 | 1.85 |
| Steel bars, Philadelphia | 1.94 | 1.96 | 1.94 | 2.04 |
| Iron bars, Chicago | 1.80 | 1.80 | 1.75 | 1.90 |
| Shapes, Pittsburgh | 1.65 | 1.65 | 1.60 | 1.76 |
| Shapes, Philadelphia | 1.76 | 1.78 | 1.81 | 1.79 |
| Shapes, Chicago | 1.75 | 1.80 | 1.70 | 1.85 |
| Tank plates, Pittsburgh | 1.65 | 1.65 | 1.65 | 1.76 |
| Tank plates, Philadelphia | 1.85½ | 1.85½ | 1.80½ | 1.90¼ |
| Tank plates, Chicago | 1.75 | 1.80 | 1.70 | 1.85 |
| Sheets, blue anl., No. 13, Pitts. | 2.00 | 2.00 | 2.05 | 2.15 |
| Sheets, black, No. 24, Pitts. | 2.25 | 2.25 | 2.35 | 2.55 |
| Sheets, gal., No. 24, Pittsburgh | 2.80 | 2.85 | 2.90 | 3.25 |
| Sheets, black, No. 24, Chicago | 2.40 | 2.45 | 2.50 | 2.70 |
| Sheets, blue anl., No. 13, Chicago | 2.15 | 2.20 | 2.20 | 2.35 |
| Sheets, galvanized, No. 24, Chi. | 2.95 | 3.00 | 3.05 | 3.35 |
| Plain wire, Pittsburgh | 2.20 | 2.20 | 2.20 | 2.35 |
| Wire nails, Pittsburgh | 1.90 | 1.90 | 1.90 | 2.15 |
| Tin plate, per base box, Pitts. | 5.00 | 5.00 | 5.00 | 5.25 |
| **SCRAP** | | | | |
| Heavy melting steel, Pitts. | 11.25 | 12.50 | 12.75 | 15.40 |
| Heavy melting steel, eastern Pa. | 9.50 | 10.00 | 10.50 | 13.40 |
| Heavy melting steel, Chicago | 8.50 | 9.60 | 9.85 | 12.55 |
| No. 1 wrought, eastern Pa. | 11.00 | 11.00 | 11.00 | 15.40 |
| No. 1 wrought, Chicago | 8.25 | 8.80 | 9.25 | 12.70 |
| Rails for rolling, Chicago | 11.00 | 11.85 | 12.10 | 14.85 |

# Sheets

## General Business Shows Little Variation—Automotive Demand Slower—Outdoor Work Slack

SHEET PRICES, PAGE 87

**Pittsburgh** — Sheet business remains slow without definite change in requirements of leading consumers. Demand for automotive sheets is declining slowly although orders from several leading interests are well sustained. Producers will have little opportunity to quote prices on the new classifications until inquiries appear for third quarter. Old prices generally are unchanged. Black sheets usually are 2.25c, although in some districts 2.15c is rather general. Galvanized sheets are 2.80c, although 2.75c is quoted occasionally. Blue annealed sheets are 2.00c for No. 13 gage, and 1.85c for Nos. 9 and 10. The former market of 3.10c on autobody sheets is being shaded $2 a ton fairly regularly.

**Youngstown, O.**—A slight improvement in demand for common grades of sheets this week led to resumption of operations at one Niles independent mill, and a small increase at one mill in this city. Sufficient specifications come to full-finished sheet mills to insure operations at about 60 per cent. Special grades of sheets are moving in fairly satisfactory volume, especially alloy sheets. Practically all sales of common black sheets are made at 2.25c, Pittsburgh, although it is admitted that recently a large buyer was able to get a price of 2.15c. No. 20 gage autobody sheets continue 3.10c, base, Pittsburgh. Some No. 18 gage sheets were sold recently at 3.00c, and No. 19 gage at 3.05c. These prices were believed manipulated to appear as if the No. 20 gage price had been cut.

**New York**—Sheet prices under the new classification are more in evidence, although some companies plan to quote them only for third quarter deliveries. No. 10 hot-rolled sheets under the new classification are offered at 1.70c, Pittsburgh; and No. 24 hot-rolled annealed, at 2.40c. No. 10 cold-rolled are 2.35c; and No. 20, 2.95c. Some mills are offering No. 24 galvanized under the new classification at 2.90c. Galvanized sheets are moving on the old basis at 2.75c to 2.85c, Pittsburgh.

**Philadelphia** — A more general disposition is noted on the part of makers to quote in accordance with the new sheet classifications, although the old system is expected to prevail for a time, particularly where it offers more attractive prices to purchasers. The New York Ship Building Co. placed 225 tons of galvanized and blue annealed sheets.

**Cleveland**—Sheet sales continue featured by occasional bursts of activity but there is no evidence of an upturn for the inactive industries. The automotive situation continues the sole bright spot, with Fisher's local plant continuing this week to hum at around 33,000 Chevrolet, Oakland-Pontiac and Oldsmobile models. Rumor of 3.00c, Pittsburgh, on autobody sheets may be attributed to basing the quotation on No. 18 gage, which under the new classification is 10 cents less than the 3.10c for the No. 20 gage base, the latter continuing unchanged as minimum. Barrel manufacturers report improvement. Galvanized are 2.80c, a lesser figure going to the jobbers. Black sheets continue 2.15c to 2.25c.

**Chicago**—Sheet mill operations are difficult to schedule because of the numerous small orders. They average 40 per cent in this district and 50 per cent in the Milwaukee area. While buying is fair for outdoor work, such as roofing, conductor pipe and road strip, this demand is far from normal.

**St. Louis**—The leading producer in this district has reduced No. 24 black sheets and galvanized $1 a ton, black now being 2.60½c, delivered, St. Louis, and galvanized 3.15½c.

# Current Finished Steel Prices

**Prices in cents per pound unless otherwise stated**

## Steel Sheets

**SHEET MILL BLACK, NO. 24**

| | |
|---|---|
| Pittsburgh, base | 2.15c to 2.25c |
| Philadelphia, delivered | 2.54c |
| Gary, Indiana Harbor | 2.35c |
| Chicago, delivered | 2.40c |
| Birmingham, base | 2.40c |
| St. Louis, del. | 2.60½c |

**TIN MILL BLACK, NO. 28**

| | |
|---|---|
| Pittsburgh, base | 2.55c to 2.65c |
| Gary, base | 2.65c to 2.75c |

**GALVANIZED NO. 24**

| | |
|---|---|
| Pittsburgh, base | 2.75c to 2.80c |
| Philadelphia, delivered | 3.09c to 3.19c |
| Chicago, delivered | 2.95c to 3.05c |
| Gary, Indiana Harbor | 2.90c to 3.00c |
| Birmingham, base | 2.95c to 3.05c |
| St. Louis, del. | 3.15½c |

**BLUE ANNEALED SHEETS NO. 13**

| | |
|---|---|
| Pittsburgh, base | 2.00c to 2.05c |
| Chicago, district mills | 2.10c to 2.15c |
| Chicago, delivered | 2.15c to 2.20c |
| St. Louis, delivered | 2.40½c |
| Philadelphia, delivered | 2.29c |
| Birmingham | 2.20c |

**BLUE ANNEALED NO. 9-10**

| | |
|---|---|
| Pittsburgh, base | 1.85c to 1.90c |
| Chicago, district mills | 1.95c to 2.00c |
| Chicago, delivered | 2.00c to 2.05c |
| Philadelphia, delivered | 2.14c |
| St. Louis, delivered | 2.25½c |
| Birmingham | 2.05c to 2.10c |

**AUTOMOBILE NO. 20**

| | |
|---|---|
| Pittsburgh, base | 3.00c to 3.10c |

**FURNITURE NO. 24**

| | |
|---|---|
| Pittsburgh, patent leveled | 3.50c |

**New Classifications, Pitts. base:**

Heavy cold-rolled No. 10, 2.35c; cold-rolled No. 20, 2.95c; heavy furniture No. 10, 2.75c; light furniture No. 20, 3.35c; furniture No. 24, including patent leveling, 3.50c. Hot-rolled No. 10, 1.70c; hot-rolled No. 24, 2.40c to 2.50c. Differentials of 10 and 15 cents, respectively, apply at Gary, Ind., and Chicago, delivered.

## Tin and Terne Plate

**Prices per 100 pound box Pittsburgh**

| | |
|---|---|
| Tin plate, coke base | $5.00 |

Gary, Ind., base 10 cents higher.

| | |
|---|---|
| Long ternes, 24, unassorted, lb. | 3.15c |

## Wire Products

**(To Jobbers-Merchant Trade)**

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

| | |
|---|---|
| Standard wire nails | $1.90 and 2.00 |
| Cement coated nails | 1.90 and 2.00 |
| Galvanized nails | 3.90 and 4.00 |

**(Per pound)**

| | |
|---|---|
| Polished staples | 2.35c and 2.45c |
| Galvanized staples | 2.60c and 2.70c |
| Barbed wire, gal. | 2.55c and 2.65c |
| Annealed fence wire | 2.35c and 2.45c |
| Galvanized wire | 2.80c and 2.90c |

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

**(To Manufacturing Trade)**

| | |
|---|---|
| Plain wire, 6-9 gage | 2.20c |
| Spring wire | 3.20c to 3.30c |

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

## Rivets

| | |
|---|---|
| Struc. c.l., Pitts.-Cleve. | 2.75c |
| Struc., c.l, Chicago | 2.85c |
| 7/16-in., smaller, Pitts. | 70,10 and 5 off |
| Chi., Cleve. | 70 to 70, 10 and 5 off |

## Steel Plates

| | |
|---|---|
| Base, Pittsburgh | 1.65c |
| Philadelphia, del. | 1.85½c |
| New York, delivered | 1.93c |
| Boston, delivered | 2.05c |
| Chicago, base | 1.70c to 1.80c |
| Cleveland, delivered | 1.83½c |
| Lackawanna, N. Y., base | 1.75c to 1.80c |
| Birmingham, base | 1.80c to 1.85c |
| Coatesville, Pa., base | 1.75c |
| Pacific Coast, c.l.f. | 2.00c to 2.05c |
| St Louis, del | 1.95½c |

## Structural Shapes

| | |
|---|---|
| Base, Pittsburgh | 1.65c |
| Philadelphia, del. | 1.76c to 1.81c |
| New York, del. | 1.85½c to 1.90½c |
| Boston, del. | 2.03½c to 2.08½c |
| Chicago, base | 1.70c to 1.80c |
| Cleveland, delivered | 1.83½c |
| Lackawanna, N. Y., base | 1.75c to 1.80c |
| Birmingham base | 1.80c to 1.85c |
| Pacific Coast, c.l.f. | 2.05c to 2.15c |

## Bars

**SOFT STEEL**

| | |
|---|---|
| Base, Pittsburgh | 1.65c |
| Chicago, base | 1.70c to 1.80c |
| Birmingham base | 1.80c to 1.85c |
| Lackawanna, N. Y., base | 1.70c to 1.75c |
| Pacific Coast, c.l.f. | 2.15c |
| Cleveland, base, local del. | 1.70c |
| Cleveland base, out. del. | 1.65c |
| Philadelphia, del. | 1.94c to 1.99c |
| New York, del. | 1.98c to 2.03½c |
| Boston, del. | 2.05c to 2.10c |
| Pittsburgh, cold finish | 1.80c to 1.85c |
| Pittsburgh, forg. qual. | 1.90c to 1.95c |

**RAIL STEEL**

| | |
|---|---|
| Chicago Heights | 1.60c to 1.65c |
| Eastern mills | 1.50c to 1.55c |
| Pittsburgh | 1.30c to 1.35c |

**IRON**

| | |
|---|---|
| Chicago, base | 1.70c to 1.80c |
| New York, delivered | 1.93c to 2.03c |
| Philadelphia, delivered | 1.89c |
| Pittsburgh, refined | 2.75c to 4.25c |

**REINFORCING**

| | |
|---|---|
| Pitts., billet cut lengths | 1.90c |
| Stock lengths, mill | 1.65c |
| Chi., billet | 1.90c to 2.00c |
| Chi., rail steel | 1.60c to 1.70c |
| Chi., rail steel, less carload | 1.90c |
| Philadelphia, cut lengths | 2.19c |
| Cleveland, cut lengths | 1.95c to 2.05c |

## Cold Finished Steel Bars and Shafting

| | |
|---|---|
| Base, Pittsburgh, Chicago, Buffalo and Cleveland | 2.10c |
| Shafting, turned and ground, mill | 2.45c to 2.90c |

## Corrosion, Heat Resist. Alloys

**Base, Pittsburgh**

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

| | A | B | C | D |
|---|---|---|---|---|
| Bars | 19c | 20.5c | 23c | 28c |
| Plates | 21c | 22.5c | 25c | 30c |
| Sheets | 26c | 27.5c | 30c | 35c |
| Hot strip | 19c | 20.5c | 23c | 28c |
| Cold strip | 28c | 29.5c | 32c | 37c |

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

## Wrought Washers

| | |
|---|---|
| Carloads, Pitts. dist. | $6.50 to $6.75 off |
| Carloads, Chicago dist. | 6.70 to 6.80 off |

## Alloy Steel

**Hot Rolled—F.o.b. Mills**

Alloy Quality Bars, 2.45c-2.65c, Mill

| S.A.E. | Alloy Diff. | S.A.E. | Alloy Diff. |
|---|---|---|---|
| 2000 | 0.25 | 1.25-1.75 Ni. | 1.05 |
| 2100 | 0.55 | 5100 .80 - 1.10 Cr. | 0.45 |
| 2300 | 1.50 | 51.00 Cr. spring | 0.20 |
| 2500 | 2.25 | 6100 bars | 1.20 |
| 3100 | 0.55 | 6100 Spring | 0.95 |
| 3200 | 1.35 | Cr., Ni., Van. | 1.50 |
| 3300 | 3.80 | Carbon Van. | 0.95 |
| 3400 | 3.20 | 9250 (flats) | 0.25 |
| 4100 .15 to .25 Mo. | 0.50 | 9250 (rds.,sq.) | 0.50 |
| 4600 .20 to .30 Mo. | | | |

## Strip, Hoops Bands

| | |
|---|---|
| Hot strip, to 6-in., Pitts. | 1.60c to 1.65c |
| Hot strip 6 1/16 to 24-in. Pitts. | 1.50c to 1.60c |
| Hot strip, bands 6 in. and under, Chicago | 1.70c to 1.75c |
| Do. 6 1/16 to 24 in. | 1.60c to 1.70c |
| Cooperage hoop, Pitts. | 1.70c to 1.80c |
| Do, Chicago | 2.00c to 2.10c |
| Cold rolled strip, Pitts., Cleve., 3 tons, over | 2.15c to 2.25c |
| Worcester, 3 tons, over | 2.40c |

## Rails, Track Material

| | |
|---|---|
| Standard bess. and open hearth rails, mill | $43.00 |
| Relay rails, Pitts., 60 to 90 lb. | $23.00 to 26.00 |
| Light rails, 25-45 mills | $34.00 |
| Light rails, Chicago | $36.00 |
| Angle bars, Chi. base | 2.75c |
| Spikes, railroad, mills | 2.70c |
| Spikes, railroad, 7/16-in. and smaller, Pitts. | 2.70c |
| Spikes boat, barge, Pitts. | 3.00c |
| Spikes, railroad, Chi. | 2.80c |
| Track bolts, Pitts., steam roads | 3.80c |
| Do. standard, jobbers | 73 off list |
| Track bolts, Chicago | 3.80c |
| Tie plate, mills | $39.00 |

## Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

**CARRIAGE BOLTS**

| | |
|---|---|
| All sizes, cut thread | 73 off |

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

| | |
|---|---|
| Eagle list | 73 off |

**MACHINE BOLTS**

| | |
|---|---|
| All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts | 73 off |

Tire bolts, 60, 10 and 10 off.

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

**NUTS**

| | |
|---|---|
| Semifinished | 73 off |

**HEXAGON CAP SCREWS**

| | |
|---|---|
| Milled | 80-10-10-5 off |
| Upset 1 in. diam. and smaller | 80-10-10-5 off |

**SQUARE HEAD SET SCREWS**

| | |
|---|---|
| Milled | 80-5 off |
| Upset 1 in. and smaller | 80-10-5 off |
| Upset, larger than 1 in. | 80-5 off |

## Cut Nails, Chain, Piling

| | |
|---|---|
| Cut nails, c.l., Pittsburgh | 2.40c to 2.50c |
| do, less carloads, 5 kegs or over, 2.65c to 2.75c; | |
| and less than 5 kegs | 2.80c to 2.90c |
| Chain, BB, BBB, 9/16-1⅛ in. | 33 1/3 off |
| Sheet piling, Pitts. | 1.90c |

# Bars

**Buying Holds Fairly Steady at Low Rate—Automotive and Cold-Finished Buyers Lead**

BAR PRICES, PAGE 87

**Chicago** — Bar mill specifications largely are from automotive builders, cold-drawn and cold-finished producers and parts makers. A gain in track-laying type tractor orders has occurred, but farm tractors and implements are lifeless. A good crop season is expected to stimulate implement orders by September, when the next production period for the implement industry normally would start. Occasionally 1.75c and 1.80c, Chicago, business is booked in spot mixed carload orders, while 1.70c remain the base. Soft steel bar mills are producing at 45 to 50 per cent, while alloy bar mills are close to 50. Sales and specifications are slightly ahead without denoting any trend.

**New York**—While restricted, demand for commercial steel bars is at least being maintained, with prices holding at 1.65c, Pittsburgh, for carlots. Absence of buying by forging interests is being keenly felt. Common iron bars are quiet at 1.60c to 1.70c, Pittsburgh, with the inside figure more general.

**Philadelphia** — Commercial steel bar buying is weaker, although 1.65c, Pittsburgh, is applying to the bulk of carload tonnage. Too little business is current to afford a real price test.

**Pittsburgh**—Steel bar demand is off only slightly from the volume of early May. Orders from automotive interests for June requirements are smaller and recent shipments have declined moderately, except in the case of several of the leading interests. Producers continue to quote 1.65c on new business with orders too small to test the market thoroughly. Only on small, undesirable business is 1.70c named.

**Youngstown, O.**—Slackening in steel bar specifications has eased mill production correspondingly so that operations vary from 30 to 40 per cent. Mills are asking 1.65c, Pittsburgh, for common bars. Sales of alloy steel bars have improved slightly.

**Cleveland**—Sales of merchant bars are only fair though some interests report more discouragingly. On the other hand, price firmness at 1.70c, Cleveland locally, and 1.65c, Cleveland outside, is noteworthy. Indicating the spotty nature of steel bar consumption, several local machine shops prove exceptions to the consuming market's average, and are on expanding operating schedules. The local steelworks, on merchant steel bars largely as well as semifinished, continues for the second consecutive week with eight open hearths pouring.

## Cold-Finished Demand Fails to Turn Upward

Cold Finished Prices, Page 87

**Pittsburgh**—Little new demand is appearing to arrest the downward trend that has prevailed in cold-finished steel bar activity since the first of the month. New business reflects the prospective decline in automotive schedules during June and shipments are effected similarly. Requirements of other consumers also are moderating slowly. The market continues 2.10c, Pittsburgh.

**Cleveland**—The market is unchanged at 2.10c, Cleveland base, on cold-finished steel bars, though releases continue to be made on previously consummated contracts at 2.00c for larger users. Specifications continue to show declines in total for sellers.

## Tin Plate Demand Is Moderating Slowly

Tin Plate Prices, Page 87

**Pittsburgh**—Activity in tin plate continues to decline gradually. A downward trend in operations and specifications is of little more than seasonal proportions. Output now is close to 70 per cent with schedules of some independent producers still at a capacity rate. Specifications remain in fair volume but are lighter than a month ago. A substantial increase in tin plate demand for the Hawaiian pineapple pack is indicated as the result of a marked gain in that crop.

**New York**—Tin plate for Japan is down 10 cents per base box, delivered, as a result of further reduction in the Far East freight rates, which now are around $4 per gross ton, compared with $8 at one time before the breakdown in the Far East shipping conference. Little buying has resulted. Welsh and German producers are underbidding American producers. It is reported German prices are 80 to 90 cents below American, even with the freight reduced.

# Plates

**Tank and Barge Requirements Feature Market—50,000 Tons Anticipated for Texas Work**

PLATE PRICES, PAGE 87

**Chicago**—Plate mills expect to ship this month and in June about 45,000 tons of skelp to Milwaukee for pipe line orders awarded during the last three weeks. Inquiry is expected momentarily from the East Texas oil fields for storage tank plates. Extent of tank programs awaits decision as to pro-rating in about three weeks. Estimates of the probable East Texas tank plate requirements are as high as 50,000 tons. Only about 1000 tons of tank work has been let. Plates are quoted at 1.70c base, although it is stated some small spot sales have been closed at 1.75c, Chicago. Orders from boilermakers and miscellaneous manufacturers show a mild spurt.

**New York**—About 6500 tons of plates have been awarded for a steel pipe line for the Hackensack, N. J., Water Co. Action on another large tonnage is expected shortly as a result of the award of the general contract for foundation work for the New York Central west side warehouse terminal to the P. T. Cox contracting Co. Demand is spotty, carloads being quoted generally at 1.75c Coatesville, Pa.

**Philadelphia**—Plate prices are easy at 1.75c, base, Coatesville, Pa. Bids were opened today for the submarine V-9, requiring 400 tons of plates and 200 tons of shapes and bars. Operations of a leading mill are down to about 40 per cent.

**Pittsburgh**—New plate business is featured by an inquiry from the Standard Oil Co. of Kentucky for 15 tank barges, requiring nearly 4000 tons of fabricated plates and shapes. Orders for river equipment are light, although a fair volume of work is pending. Plate specifications are fairly steady but lack improvement over the rate a month ago. Prices are provided little test, the market generally continuing 1.65c, Pittsburgh.

**Cleveland**—With a fair run of miscellaneous orders, the plate market continues to show a tendency to-

ward weakness in comparison with earlier months in 1931. Sellers point out that nearly all heavy consumers withhold their purchases. The 200 gondolas for the Wheeling & Lake Erie will place a fairly sizable quantity of plates locally if the contract is awarded to a nearby car shop, as generally expected.

Plates wll be purchased by the Lima Locomotive Works, Lima, O., for five 21,000-gallon locomotive tenders for Central Railroad of New Jersey.

## Contracts Placed

300 tons, plates and shapes, two steel hulls, for United States engineers, St. Louis district, to St. Louis Structural Steel Co., St. Louis.

250 tons, sheet piling, municipal pier, Lorain, O., to Carnegie Steel Co., Pittsburgh, through John Dandrea, Lorain, general contractor.

209 tons, sheet steel piling, United States army engineer, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

## Contracts Pending

1000 tons, sheet piling for Charlotte (Port of Rochester) N. Y.; bids May 29.

500 tons, plates and shapes, pipe line dredge for United States engineers, Vicksburg district; Nashville Bridge Co., Nashville, Tenn., low bidder.

500 tons, 11,000 feet 24 to 30-inch riveted or smooth-bore steel water pipe, for Vancouver, B. C.; bids June 2.

## Iron Ore Shipments Show Lagging Tendency

**Iron Ore Prices, Page 98**

**Cleveland**—Estimates of the season's shipments of Lake Superior iron ore are being revised downward, as shipping instructions lag and new business fails to appear. Present prospects point to a total of 35,000,000 to 40,000,000 tons, the lowest since 1921, with 22,800,000 tons. For the first half of May shipments amounted to approximately 250,000 tons, less than one day's tonnage in the midseason of a normal year. The Lake Superior Iron Ore association's current report on consumption and balances follows:

| | Tons |
|---|---|
| Ore consumed in March | 2,835,439 |
| Ore consumed in April | 2,825,647 |
| Decrease in April | 9,792 |
| Ore consumed in April, 1930 | 4,575,525 |
| Ore on hand at furnaces May 1, 1931 | 23,292,605 |
| Ore on Lake Erie docks May 1, 1931 | 5,429,721 |
| Total at furnaces and Lake Erie docks May 1, 1931 | 28,722,326 |
| Total May 1, 1930 | 20,284,503 |

Wedlake Aluminum Co., 1616 Willow street, Hoboken, N. J., has succeeded the Wedlake & Lamsen Co., D. C. Wedlake is proprietor.

# Railroads

**New Rail and Equipment Buying Quiet—Releases Sustain Mill Operations at Chicago**

**TRACK MATERIAL PRICES, PAGE 87**

**New York**—Fresh car and locomotive inquiry is at a virtual standstill, with buying light.

Ramapo Ajax Corp. and Bethlehem Steel Co. were low on special rails, frogs and switches for the board of transportation, two contracts being involved, orders 57 and 60.

Bethlehem Steel Co. has taken 2000 tie plates for the Picatinny arsenal, New Jersey.

**Pittsburgh**—The railroad market is quiet in new inquiry while specifications against old orders are fairly steady at a rate slightly lower than in April. Rail mill operations are seasonally quiet and car builders have little unfilled business on books.

**Cleveland** — Wheeling & Lake Erie railroad's inquiry for 200 gondolas is now reported without foundation, Canton Car Co., which does W. & L. E. repairs having indicated the carrier has not made repairs since last fall, let alone purchase of new rolling stock. If anything, gondolas now in use will be repaired. Other rail ordering is quiet and releases fail to embrace any significant totals.

**Chicago**—Recent brisk releases for track fastenings, indicating the extent of track maintenance work, are being maintained. Specifications for angle bars, tie plates, bolts and spikes during the week again have been virtually doubling the recent shipping orders. About 1200 tons of fresh track accessory business has been booked. Releases for rails are steady enough to keep rail mills occupied at 45 per cent.

About 6000 tons of finished steel and axles will be apportioned this week for the 500 Northern Pacific stock car underframes, superstructures for which will be let later. Chicago, Burlington & Quincy has obtained permission to build a new 30-mile line between Wellington and Shamrock, Tex.

**Seattle**—Great Northern railroad has placed 500 tons of track spikes with the Pacific Coast Forge Co., Seattle. Spikes are for use on the road's extension into California. Tie plates for the same extension, 4000 tons, will be supplied by the Pacific Coast Steel Corp., Seattle.

## Car Orders Placed

Standard Oil Co. of New Jersey, four tank cars, to Magor Car Corp., Passaic, N. J.

## Locomotives Placed

Central Railroad of New Jersey, 5 locomotive tenders, to Lima Locomotive Works, Lima, O.

## Locomotives Pending

United States Engineers, Memphis, Tenn., one 10-ton gasoline locomotive; this inquiry was previously reported as involving 10.

## Rail Orders Pending

400 tons, estimated, special rails, frogs and switches, board of transportation, New York, Ramapo Ajax Corp., Hilburn, N. Y., and Bethlehem Steel Co., Bethlehem, Pa., low, two contracts, orders 57 and 60; bids May 12.

## Semifinished Orders Small; Sheet Bars Are Easier

**Semifinished Prices, Page 98**

**Pittsburgh**—Shipments of semifinished steel continue off moderately from the April rate while new business remains at a low level. Orders usually call for only small lots. Although prices are easy, tonnage is insufficient to test quotations. Producers are quoting $30, Pittsburgh, for rerolling billets, slabs and sheet bars, with $36 the usual market for forging billets. Wire rods are a flat $35.

**Youngstown, O.**—Billets and slabs are moving at $30, Youngstown and Pittsburgh, and sheet bars at $29 to $30. Skelp, which has been quoted at 1.60c to 1.70c, Pittsburgh, is being sold in small lots at 1.60c, while some of special thin gage and narrow width brings as much as 1.75c. A flurry came about through demand of a roller of cold strip that skelpmakers ship him the hot-rolled material as skelp, thus bringing his price down to about 1.40c. Important makers refused, fearing they would endanger the entire semifinished steel freight rate structure.

**Cleveland**—Specifications for sheet bars, billets and slabs in the past week were larger than in the week preceding. Few new orders are being placed. The leading merchant producer continues to operate eight of its 14 open hearths. Sheet bars are $29 to $30, base, Cleveland and Youngstown, O., and billets and slabs, $30.

**Chicago** — Piecemeal buying of finished steel, particularly small billets and blooms, is noted. Prices are unchanged at $31, Chicago, for 4 x 4-inch billets, while forging billets remain $36, base.

# Structural Shapes

**Prospects Continue Brighter in West — 58,700-Ton New Orleans Bridge Will Be Deferred — Fabricated Prices Soft—Fresh Inquiry Lightens in Eastern Districts**

STRUCTURAL SHAPE PRICES, PAGE 87

**Chicago**—Structural steel fabricators face brighter prospects late in the summer when a number of federal and state construction projects will materialize. Bids on the Chicago postoffice, 25,000 tons, will be asked in about seven or eight weeks. Bids will be asked in June and July on about 40 postoffice jobs in Illinois. About 3500 tons of structural work has come out in fresh inquiry, largely public work here and on the Pacific coast. Base price for plain material remains at 1.70c, Chicago. Fabricators in the Twin Cities area have been booking numerous small p. 'ects running into important volume.

**New York**—Fresh inquiry for structural steel is light. While several large projects will develop during the next few weeks, general construction outlook is not bright outside public work. Port of New York authority inland freight terminal and the parcel post building are the largest pending projects, general contract bids being expected within a few weeks. More grade crossing eliminations approach the active stage in the east. Armory additions at Kingston and Newburgh call for 1000 tons. Plain material is 1.855c, New York, but extended contracts have tended to reduce new business at this minimum. Fabricated and erected prices are still weak and unsteady.

**Philadelphia**—While lacking volume, structural inquiries are slightly more numerous. Fabricated prices are easy with shapes 1.70c, carload, nearest mill, or 1.76c, Philadelphia.

**Pittsburgh**—Little change is noted in specifications for plain structural shapes while activity in fabricated shape awards continues restricted. Inquiry, although slightly heavier than a month ago, involves only small lots. Shape prices are untested, generally continuing 1.65c, Pittsburgh.

**Cleveland**—Though lacking award of consequence the structural market has been augmented by a quantity of railroad crossing elimination work in surrounding districts. These projects are headed by the New York Central, Wabash and Nickel Plate's plans. Fabricated prices are weak on building work. The Stark county dry goods store has been awarded. The Fairport, O., assembly plant for Ford Motor Co. is nearing a more active stage under a Detroit architect. On plain material the 1.65c, Pittsburgh, price has had little test. The Ohio Bell telephone plans have come out for a new building on St. Clair avenue.

## Contracts Placed

1000 tons, Illinois bridgework, to Worden-Allen Co., Milwaukee, and Vincennes Bridge Co., Vincennes, Ind.

1000 tons, bridge, Grafton, Pa., for Pennsylvania railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

843 tons, Allen road grade separation, Oakwood, Mich., for Wabash railroad, to American Bridge Co., Pittsburgh.

800 tons, new Trier high school, Winnetka, Ill., to New City Iron Works, Chicago.

750 tons, flume supports for Southern California Edison Co., to Emsco Derrick & Equipment Co., Los Angeles.

650 tons, Cress building, Sacramento, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.

600 tons, Pacific Great Eastern bridge, B. C., to Western Bridge Co. Ltd., Vancouver, B. C.

600 tons, Cardozo building, Sacramento, Calif., to St. Paul Foundry Co., St. Paul.

545 tons, viaduct, route 4, section 3, Englewood, N. J., to McClintic-Marshall Corp., Bethlehem, Pa., through F. E. Baker, Montclair, N. J., general contractor.

500 tons, Masonic temple, Fort Worth, Tex., to Fort Worth Structural Steel Co.; Harry B. Friedman, general contractor.

500 tons, viaduct, Webster Grove, Mo., Missouri Pacific railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

500 tons, city hospital pediatric building, Boston, to Boston Structural Co., Boston.

452 tons, bridge, Framingham, Mass., to McClintic-Marshall Corp., Bethlehem, Pa.

425 tons, Stark county dry goods store, Canton, O., to Hiner Structural Steel Co., Canton, through Warren Hoffman Co., general contractor.

400 tons, theater, Philadelphia, to Richard de Cou Co., Philadelphia.

400 tons, exchange building for Illinois Bell Telephone Co., Joliet, Ill., to Gage Structural Steel Co., Chicago; reported last week to unstated.

400 tons, bridge, Pine Valley, N. Y., for Pennsylvania railroad ,to American Bridge Co., Pittsburgh.

360 tons, C. & R. railway, Lulu Island bridge, Fraser river, British Columbia, to Dominion Bridge Co. Ltd., Vancouver, B. C.

350 tons, bridge, Fort Henry, N. Y., to American Bridge Co., Pittsburgh.

350 tons, Pacific Great Eastern bridge, B. C., to Dominion Bridge Co. Ltd., Vancouver, B. C.

350 tons, plant addition, Pennsylvania Sugar Refining Co., Philadelphia, to McClintic-Marshall Corp., Bethlehem, Pa.

345 tons, White Oak creek bridge, Omaha, Tex., to Petroleum Iron Works, Beaumont, Tex.

342 tons, highway bridge, Troy, N. Y., to American Bridge Co., Pittsburgh.

324 tons, two-span 320-foot bridge, Chenango Forks, Broome county, New York, to American Bridge Co., Pittsburgh, work to be done in Elmira plant; 25 tons reinforcing bars to Concrete Steel Co., Pittsburgh; Scott Bros. Construction Co., Rome, N. Y., general contractor.

300 tons; office building, Albany, N. Y., to Eastern Bridge & Structural Co., Worcester, Mass.

300 tons, barracks, Barksdale field, Shreveport, La., to Decatur Iron & Foundry Co., Decatur, Ala.; Ashton Glassell Co., Shreveport, general contractor.

300 tons, interior spans, Rosenwald museum, Jackson Park, Chicago, to unstated fabricator.

300 tons, boiler house for Swift & Co., Chicago, to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, telephone building, Providence, R. I., to unstated Providence fabricator.

280 tons, bridge for Michigan state highway department, Bridgeport, Mich., to American Bridge Co., Pittsburgh.

277 tons, Boston elevated railway power house extension, Boston, to New England Structural Co., Boston.

275 tons, highway bridges in Minnesota to Minneapolis-Moline Power Implement Co., Minneapolis, and Lakeside Bridge & Steel Co., Milwaukee.

270 tons, two bridges for Cleveland Union Terminals Corp., Cleveland; one bridge, 220 tons for Chatham avenue; second, 50 tons for Lorain avenue, both to McClintic-Marshall Corp., Bethlehem, Pa., through Industrial Construction Co., Cleveland.

250 tons, overhead highway bridge, Fort Crook, Nebr., to Omaha Structural Steel Co., Omaha, Nebr.

250 tons, jail and office building, Morristown, N. J., to Arny Steel Construction Co., Elizabeth, N. J.; Bontempo & D'Annunzio Inc., general contractors. Reported last week as 200 tons. Jail equipment to Van Dorn Iron Works, Cleveland, O.

250 tons, municipal asylum, Philadelphia, rewarded to Morris, Wheeler & Co., Philadelphia.

250 tons, building No. 11 for R. & H. Co., Niagara Falls, N. Y., to Lackawanna Steel Construction Co., Buffalo.

250 tons, St. Mary's mission, Techny, Ill., to New City Iron Works, Chicago.

250 tons, Morton street bridge, Boston, to American Bridge Co., Pittsburgh.

## Awards Compared

| | Tons |
|---|---|
| **Awards this week** | **19,353** |
| **Awards last week** | **18,677** |
| **Awards two weeks ago** | **22,690** |
| **Awards this week in 1930** | **34,180** |
| **Av. weekly awards, 1930** | **35,242** |
| **Av. weekly awards, 1931** | **38,977** |
| **Av. weekly awards, April** | **49,224** |
| **Total awards to date, 1930** | **735,224** |
| **Total awards to date, 1931** | **818,519** |

225 tons, bridge for Louisville & Nashville railroad, Henderson, Ky., to Missouri Valley Bridge & Iron Works, Leavenworth, Kans.

225 tons, delivery shed, Bienville Street wharf, New Orleans, to Jones & Laughlin Steel Corp., Pittsburgh.

200 tons, highway bridges in North Dakota to Illinois Steel Bridge Co., Jacksonville, Ill., and Minneapolis-Moline Power Implement Co., Minneapolis.

200 tons, school, Clifton, N. J., to John K. Cooke & Son, Clifton.

200 tons, New England Fuel & Transportation Co. unit, Everett, Mass., to Wellman Engineering Co., Cleveland.

180 tons, Ford & Kendig pipe plant, Conshohocken, Pa., to Belmont Iron Works, Philadelphia.

175 tons, substations, board of transportation, subway division, Jay and Smith streets, Brooklyn, N. Y., to Easton Structural Steel Co., Easton, Pa.; Reiss Construction Co., Brooklyn, general contractors.

175 tons, Pennsylvania railroad bridge, Bristol, Pa., to Belmont Iron Works, Philadelphia.

170 tons, small bridges for Rock Island railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, state highway bridge for Wilks and McDuffy counties, Ga., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, school building, Charlestown district, Boston, to New England Structural Co., Boston.

150 tons, apartment, Ocean avenue, Brooklyn, N. Y., to Simon Holland & Son, Brooklyn.

127 tons, two state bridges, Alleghany county, N. Y., 78 tons to Joseph T. Ryerson & Son, Inc., Chicago; 49 tons to McClintic-Marshall Corp., Bethlehem, Pa.; William L. Collins, Hornell, N. Y., engineer and contractor.

125 tons, highway bridge, Boston, to American Bridge Co., Pittsburgh.

115 tons, St. Theresa church, Eighty-first and Wood streets, Chicago, to New City Iron Works, Chicago.

103 tons, beam spans for Ross county, O., to Brookville Bridge Co., Brookville, O.

100 tons, apartment, Lehigh avenue, Philadelphia, to American Fabricators Inc., Philadelphia.

100 tons, apartment, Nostrand avenue, Brooklyn, N. Y., to Simon Holland & Son, Brooklyn.

100 tons, building, National Capital Press, Washington, to Jones & Laughlin Steel Corp., Pittsburgh.

100 tons, post office, Newburgh, N. Y., to Guibert Steel Co., Pittsburgh.

100 tons or more, high school, Westwood, N. J., to Selback-Meyer, West New York, N. J.

100 tons, bridge, route 21, 25 and 29, Philadelphia, to Linde-Griffith Construction Co., Newark, N. J.

100 tons, public bath-house, 134th street, New York, to Berkshire Iron Works, Brooklyn, N. Y.

100 tons, children's pavilion, St. Luke's hospital, Greenwich, Conn., to Just Structural Steel Co., White Plains, N. Y.

100 tons, additions to Fisk street substation, Commonwealth Edison Co., Chicago, to Vierling Steel Works, Chicago.

## Contracts Pending

58,700 tons, bridge, Mississippi river above New Orleans, Public Belt railroad commission, Frank H. Joubert, secretary, Municipal building, New Orleans; bids delayed. Work also includes 1250 tons heat-treated eye bars, 458,000 linear feet steel reinforcing trusses, 537,500 square feet mattress protection, 5000 steel driving shoes for piles. Four contracts; 3, substructure main bridge; 4, superstructure, main bridge; 5, substructure approaches; 6, superstructure approaches.

30,000 tons, Ohio river bridge for Louisville & Nashville railroad, Henderson, Ky.

5800 tons, Broadway Temple, 174th street, New York.

3000 tons, grade crossing elimination work, South Bend, Ind., for New York Central railroad.

1450 tons, highway bridge, Ventura, Calif.

1200 tons, Sixth street viaduct, Los Angeles, Calif.

1200 tons, chapel, Girard college, Philadelphia; specifications soon; H. H. Gravell, engineer.

1160 tons, Humboldt park substation for Commonwealth Edison Co., Chicago.

1000 tons, substation, Garland court, Chicago, for Commonwealth Edison Co., Chicago; reported last week as 200 tons.

1000 tons, Y.M.C.A., Toledo, O., project to be dropped temporarily; to be revived within four months.

1000 tons, repairs and additions, state armory, Kingston and Newburgh, N. Y.; bids May 29.

600 tons, three grade crossing eliminations, Toledo, O., for Wabash and Nickel Plate railroads; bids May 21.

300 tons, Hammet hospital, Erie, Pa.

450 tons, courthouse, Clarksburg, W. Va.; bids within six weeks; Walker & Weeks, Cleveland, architects.

750 tons, highway bridges, Wisconsin.

700 tons, post office and customs buildings, Oakland, Calif.

665 tons bridge over Sheepscot river, Maine.

500 tons, bridge over Canadian National railroad, Hamilton, Ont.; bids received until June 2 by W. L. McFaul, engineer, city hall.

400 tons, public school 52, Vermilyea avenue, Bronx, N. Y.

400 tons, school, Merion township, Delaware county, Pa.

300 tons, highway bridge, Dyerville, Calif.

300 tons, interior beams for Rosenwald museum, Jackson park, Chicago.

300 tons, addition to nurses' home at sanitorium, Boylston, Mass.

295 tons, bridge for Coshocton-Mt. Vernon, O., road, Coshocton county, O.

260 tons, two bridges, Montgomery county; Ira Reighter, Harrisburg, Pa., general contractor.

250 tons, Robinson memorial hospital, Ravenna, O.

250 tons, building for Chicago historical society, Clark street and North Avenue, Chicago, general contract to Lundoff-Bicknell Co., Cleveland.

(*Concluded on Page* 95)

# Concrete Bars

**Improvement in Demand Is Practically Universal —Large Orders Still Hang Fire at Chicago—Awards Headed by 1100-Ton College Total Awards 5510 Tons**

REINFORCING BAR PRICES, PAGE 87

**Chicago**—Reinforcing bar shipments have gained each month this year over 1930. Monthly gains have been as much as 10 per cent. For building work, billet bars are shaded in bids to 1.85c. About 1500 tons will be distributed to fabricators for Illinois road work from the May 12 letting, instead of 3000 tons. Bars for the outer drive bridge, 700 tons, will be formally awarded soon.

**New York**—New billet concrete reinforcing steel prices tend firm on small lots, but easiness prevails on attractive business. A heavy tonnage remains to be placed. Fresh inquiry is light. Bids went in May 20 on the Emmons avenue sewer, Brooklyn, about 600 tons. Road mesh holds well, although several eastern states are specifying macadam and oil as highway finish in larger volume.

**Boston**—Small projects took 150 tons of concrete bars this week. Addition to the Edison Electric distribuing plant will take 170 tons.

**Philadelphia**—Reinforcing bar demand is featured by the placing of 325 tons for the York, Pa., filtration plant. The market is 1.60c to 1.65c, Pittsburgh, or 2.25c to 2.30c, delivered locally by trucks.

**Pittsburgh**—Reinforcing bar demand has improved recently and May business gives indications of exceeding that of April. Prices are fairly steady at 1.65c for stock lengths and 1.90c for cut lengths except on large lots where some concessions are noted.

**Buffalo**—Considerable inquiry is out, more than 1000 tons all told, of

(*Concluded on Page* 95)

## Awards Compared

| | Tons |
|---|---|
| **Awards this week** | **5,510** |
| **Awards last week** | **6,360** |
| **Awards two weeks ago** | **8,296** |
| **Awards this week in 1930** | **9,287** |
| **Av. weekly awards, 1930** | **6,990** |
| **Av. weekly awards, 1931** | **6,952** |
| **Av. weekly awards, April** | **5,627** |
| **Total awards to date, 1930** | **151,308** |
| **Total awards to date, 1931** | **140,517** |

# Strip

**Mills Would Firm Market on Hot-Rolled — Automotive Demand Slackens**

STRIP PRICES, PAGE 87

**Pittsburgh**—Strip steel specifications and shipments are fairly steady, some producers finding no change over the past two weeks. Automotive demand still is spotty, requirements of Chevrolet and Chrysler being well sustained, while Ford orders are declining with a further substantial drop indicated for June. Prices are unchanged with some producers attempting to obtain 1.65c and 1.55c on all new business in hot strip, the market continuing quotable at a range of $1 a ton below these levels. Cold-rolled strip is 2.15c to 2.25c. Mill operations hold around 40 per cent.

**New York**—A mild improvement in strip demand is noted here. However, this has tended to emphasize the weakness in prices rather than lead to strength. While 1.55c still is being done on wide hot strip, the general figure is now 1.50c, Pittsburgh, with narrow strip also moving more freely at 1.60c. Cold-rolled strip is moving more generally at 2.15c, Pittsburgh although 2.25c has not disappeared.

**Youngstown, O.**—Strip specifications are coming to district mills in much the same volume this week as last. Consumers insist upon quick shipments. One maker here who is quoting 1.55c and 1.65c, Pittsburgh, respectively on wide and narrow hot-rolled, or $1 a ton higher than the minimum, also is quoting Chicago delivery 10 cents higher. This maker claims several other stripmakers are quoting on the same basis.

**Cleveland**—A leading interest in the hot-rolled strip market has announced its minimums on wide and narrow respectively at 1.55c and 1.65c, Pittsburgh. On less-carload business $1 a ton over these figures is being applied on sales made over the week. For this interest at least the 1.50c and 1.60c figures have presumably vanished within the week. Hot strip demand has tapered since last week, when a good upturn was reported. Cold-rolled strip continues unchanged. The 2.25c, Cleveland, base is being quoted on new business, though 2.15c is currently rumored from certain quarters.

**Chicago**—Third-quarter prices on hot-rolled strip have been announced here and are reaffirmation of quotations named at the beginning of the second quarter, or 1.75c for strip under six inches and 1.65c, Chicago, for wide sizes. This range is $1 a ton above existing quotations. Prices of 2.15c, Pittsburgh and Cleveland, are being made here for cold-rolled strip.

## Warehouse Sales Show May Holds Previous Levels

Warehouse Prices, Page 109

**Detroit**—Warehouse sales continue the modest gains of the earlier months of this year. Material for die and similar work preliminary to model changes is lower than usual owing to concentration of model changes late in the year. Structural steel is in light demand. Prices are unchanged.

**Boston**—Warehouse sales have been better in the past four weeks than for two months previous.

**New York**—Cold-rolled strip out of warehouse has been marked down to 4.55c, base. Warehouse volume in cold-rolled products holds steady, with some noting a slight increase. Shipments in other lines are at about the April rate.

**Philadelphia** — Warehouse prices are unchanged. Buying is quiet and unchanged from last week.

**Pittsburgh**—Demand continues to decline slowly, business so far in May being lighter than during the corresponding April period. Prices are quotably unchanged.

**Cleveland**—May tonnage from stock is holding surprisingly well to the April level and thus far is ahead of the commitment of customers in both January's and February's similar period. Cold-rolled strip is now 5.55c out of store; other prices are unchanged. A leading interest is revising its cutting charges to be on a per piece basis, instead of per hundredweight.

**Cincinnati**—May will close not sufficient to disclose any trend in comparison with March and April.

**Chicago**—Warehouse steel sales the first ten days of May were higher than any like period this year, but represented only a small gain over the April peak seven-day period. Mills are taking more small-lot orders similar to 1921, 1924 and 1926. Sheet jobbing is spotty.

**St. Louis**—Moderate improvement has taken place and the outlook for the next few weeks has points of hopefulness. Outlet for building has prospects with permits issued in April for new construction in St. Louis reaching the highest since the same month of 1930.

## Operations Recede Slightly at Leading Centers

**Youngstown, O.**—Steel operations this week drifted to 41 per cent capacity, off one point from last week. A four point loss to 44 per cent for Republic Steel and reports that a fair amount of pipe business is likely to be placed in the valley on or about June 1 are significant developments. Sheet & Tube operations, although major operations at the Brier Hill plant have been suspended, are still in excess of 30 per cent because of a slight increase in the ingot melting rate at the Campbell plant. Carnegie operations hold at 50 per cent but Sharon Steel Hoop activity is up to 67 per cent. Newton Steel is producing sheets at Newton Falls at a 60 per cent rate and is slowly adding to operations at Monroe, Mich.

**Philadelphia**—Ingot operations in the eastren Pennsylvania steelworks are down five points this week to a weighted average of 38 per cent. A leading independent is down 43 per cent, likewise off five points.

**Buffalo**—Operations hold at 54 per cent this week, with 20 of 37 open hearths in production.

**Pittsburgh**—Ingot output holds around 45 per cent with blast furnace activity up one to 22 active of the 54 steelworks stacks in the district. Sheet production is slightly lower at around 40 per cent with tin plate down to slightly above 70. Strip schedules continue 40 with pipe unchanged at 35.

**Cleveland**—Ingot operations continue at 59 per cent the pace set last week. Twenty of 34 open hearths are pouring, with the leading interest operating eight of its 14 furnaces for the second consecutive week.

**Chicago**—Further decline has occurred in ingot output, which is 45-48 down from last week's 48 per cent. Active steelworks blast furnaces number 14 out of 36. Finishing mill operations are variable with a downward tendency, resulting in part from the necessarily frequent roll changes because of numerous small orders.

**Birmingham, Ala.** — Operations are down five points to 60 per cent this week. Gulf States Steel has two open hearth furnaces on and Tennessee Coal, Iron & Railroad Co. is varying between 11 and 13. Ensley Works are cutting down unfilled rail tonnage steadily, with completion in sight in next four to six weeks.

## Concrete Bars

(*Concluded from Page 91*)

which one job of 470 tons is the largest. Most of the pending business will go rail steel.

## Contracts Placed

1100 tons, Principia college, St. Louis, to Laclede Steel Co., St. Louis.

800 tons, passenger station, Cincinnati union terminal, to Pollak Steel Co., Cincinnati. Award of 200 additional tons delayed until fall.

530 tons, medical building, Louisiana state university, Baton Rouge, La., to Laclede Steel Co., St. Louis; 49 tons shapes to Jones & Laughlin Steel Corp., Pittsburgh; R. P. Farnsworth & Co. Inc., New Orleans, general contractor.

725 tons, bar joists, science exhibits building, Century of Progress exposition, Chicago, to Truscon Steel Co., Youngstown, O.

500 tons, road work, Missouri, to several unstated fabricators.

400 tons, barracks, Barksdale field, Shreveport, La., to North Texas Iron & Steel Co., Ft. Worth, Tex.; Ashton Glassell Co., Shreveport, general contractor.

400 tons, hydraulic laboratory, Bureau of Standards, Washington, to Buffalo Steel Co., Tonawanda, N. Y.

300 tons, veterans hospital, Tuscaloosa, Ala., to Connors Steel Co., Birmingham, Ala.; H. B. Nelson Construction Co., Columbus, Ga., general contractor; structural steel still pending.

325 tons, filtration plant, York, Pa., to Taylor-Davis Inc., Philadelphia.

300 tons, Lorain street bridge, Cleveland, for Cleveland Union Terminals Corp., to Truscon Steel Co., Youngstown, O., through Industrial Construction Co., Cleveland; reported last week as going to unstated.

250 tons, five state buildings, Bedford Hills and West Haverstraw, N. Y., to Kalman Steel Co., through Corss & Roberts, general contractors.

225 tons, Masonic temple, Fort Worth, Tex., to North Texas Iron & Steel Co., Fort Worth; Harry B. Friedman, general contractor.

200 tons, bridges, Edgecomb county, North Carolina, to Virginia Steel Co., Richmond, Va.; T. A. Loving & Co., Goldsboro, N. C., general contractor.

200 tons, highway, Bronx Parkway Extension from Kitchawan Road to Croton lake, Westchester county park commission, Bronxville, N. Y., to Concrete Steel Co., Pittsburgh; A. W. Banko, White Plains, N. Y., general contractor.

175 tons, warehouse, Thomas Somerville Co. to Rosslyn Steel & Cement Co., Rosslyn, Va.

160 tons, grade crossings, Chenango Forks and Whitney Point, N. Y., for Delaware, Lackawanna & Western railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, bridge and paving, state highway department, Clermont county, Ohio, to Jones & Laughlin Steel Corp., Pittsburgh.

150 tons, New Trier high school, Winnetka, Ill., to Inland Steel Co., Chicago.

150 tons, building for Petrolagar Laboratories Inc., Niles Center, Ill., to Calumet Steel Co., Chicago.

150 tons, Illinois road work to Concrete Steel Co., Chicago.

150 tons, Illinois road work, to Truscon Steel Co., Youngstown, O.

125 tons, Charles street bridge, Rockford, Ill., to Kalman Steel Co., Chicago.

100 tons, hospital, Fond du Lac, Wis., to Olney J. Dean & Co., Chicago.

100 tons, Illinois road work to Kalman Steel Co., Chicago.

100 tons, Illinois road work, to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, Illinois road work, to Olney J. Dean & Co., Chicago.

100 tons, public library, Evansville, Ill., to Laclede Steel Co., St. Louis.

## Contracts Pending

1345 tons, Mississippi river above New Orleans, Public Belt railroad commission, Frank H. Joubert, secretary, Municipal building, New Orleans; bids June 4.

700 tons, outer drive bridge, Chicago.

675 tons, bridge over Arkansas river, Twenty-first street, Tulsa, Okla.; bids in May 19.

600 tons, sewer, Emmons avenue, Sheepshead Bay district, Brooklyn, N. Y.; bids in.

475 tons, additional buildings, East Buffalo, N. Y.; food terminal; bids soon.

400 tons, school buildings, Boston.

200 tons, Mermentu river bridge, Lake Arthur, La.; Doullut and Ewin, New Orleans, low bidder.

125 tons, building for Chicago Historical society, Clark street and North avenue, Chicago; general contract to Lundoff-Bicknell Co., Cleveland.

100 tons, Science building, Century of Progress exposition, Chicago.

Unstated tonnage, 50,000 pieces reinforcing fabric, for flood control, Mississippi river, Bridge Junction, Ark.; bids opened June 4, United States district engineer's office, McCall building, Memphis, Tenn.

## Structural Shapes

(*Concluded from Page 91*)

225 tons, Clarington bridge, Sunfish creek, Monroe county, O.

200 tons, Reading railroad passenger station, Jenkintown, Pa.

220 tons, also 63 tons reinforcing bars for Hell Gate bridge, Lane county, Oreg., for United States bureau of public roads, Portland, Oreg.; bids received May 20.

184 tons, shapes, and 30 tons bars, 2-story vocational school, Holyoke, Mass.; Casper Ranger Construction Co., general contractor.

150 tons, Lucas county, O., bridge; New Bremen Bridge Co., New Bremen, O., low; award May 21.

124 tons, bridge, Teaneck road, route 4, section 3, Teaneck, N. J.; bids June 1, state highway commission, New Jersey; A. Lee Grover, chief clerk. Work also includes 52 tons reinforcing bars.

100 tons, additions to Fisk street substation, Commonwealth Edison Co., Chicago.

100 tons, city charities administration building, Boston.

Unstated tonnage, two bridges, Lake county (Painesville), O.; one bridge at Willoughby, O., second at Painesville, O.; to be built by county.

Unstated tonnage, assembly plant, Fairport, O., for Ford Motor Co., Dearborn, Mich.; site selected, plans under way by Albert Kahn, architect, Marquette building, Detroit.

Unstated tonnage, grade crossing elimination work, Geneva, O., for New York Central railroad.

# Pipe

### Seamless Order for 20,000 Tons Placed—Another 15,000 Due for Award

PIPE PRICES, PAGE 109

**New York**—Cast iron pipe prices continue weak. As low as $31.70 is reported for delivery on 8-inch to Westchester county while a New Jersey foundry took a Washington award of more than 1000 tons at $32.97, delivered, 12 and 20-inch. New inquiry is light. Yorktown Heights is in the market for a fair-sized tonnage. General contract is let on two pumping station projects calling for about 200 tons.

**Philadelphia**—Indications point to the withdrawal of the recently established base minum two fives on butt and lapweld pipe on direct mill shipment with a possibility of a different method of quoting being involved. Present discount is regarded by some as allowing too much latitude in relation with the jobbers.

**Pittsburgh**—Developments in the line pipe market are headed by the award of 20,000 tons of 10-inch seamless pipe for a 198-mile line of the Sun Oil Co. to be laid in Texas. The order went to a Pittsburgh producer. The Lycoming Natural Gas Co., subsidiary of the Standard Oil Co. of New Jersey, is expected to place 15,000 tons of 20-inch pipe for a line in Pennsylvania and New York shortly.

**Chicago**—About 5000 tons of municipal cast pressure pipe is pending. Chicago board of public works is expected to award 5700 tons of 6 to 12-inch to four bidders able to meet urgent delivery requirements. Detroit took bids last week on 1900 tons of 12-inch as an extension of the order for 10,000 feet of the same size let recently to American Cast Iron Pipe Co. Racine, Wis., will award 750 tons of 30 and 36-inch cast pipe and heavy fittings, for which the low bid, coverings both pipe and fittings, was $47.00. Louisville, Ky., has a pipe program that may include some cast. Detroit has let 700 tons of 36-inch. Municipal prices for 6 to 24-inch sizes are nominal.

## Cast Pipe Placed

2300 tons, 8-inch, for Washington, to Lynchburg Foundry Co., Lynchburg, Va.

1125 tons, 12 and 20-inch, for Washington, to R. D. Wood & Co., Florence, N. J.

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—
***"Nevastain"***
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**SHARON STEEL HOOP COMPANY — SHARON, PENNA.**

1500 tons, Canadian delavaud, for various British Columbia buyers, to Evans, Coleman & Evans Ltd., Vancouver, B. C.

700 tons, 36-inch for Detroit to Lynchburg Foundry Co., Lynchburg, Va.

325 tons, 6 and 8-inch, New Britain, Conn., to R. D. Wood & Co., Philadelphia.

200 tons, 10 and 12-inch Canadian delavaud for Vernon, B. C., to Evans, Coleman & Evans Ltd., Vancouver, B. C.

150 tons, 6 to 12-inch monocast for various Seattle projects, to American Cast Iron Pipe Co., Birmingham, Ala.

100 tons, various sizes, for Lawrence, Mass., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

100 tons, pipe and fittings, for Springfield, Mass., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

100 tons, various sizes, for Providence, R. I., to Allen & Read, Boston.

170 tons, 6 and 8-inch, for Beverly, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

Unstated tonnage, 13,094 lineal feet 6-inch, 4507 feet of 8-inch, and 590 feet 20-inch cast iron pipe, for Oakfield, Wis., to James B. Clow & Sons, Chicago.

## Steel Pipe Placed

20,000 tons, 198 miles, 10-inch seamless pipe, for Sun Oil Co. line, Beaumont, Tex., to East Texas oil fields, to Jones & Laughlin Steel Corp., Pittsburgh.

6500 tons, steel pipe for Hackensack, N. J., Water Co., awarded through T. A. Gillespie & Co., to East Jersey Pipe Co.; plates to Carnegie Steel Co., Pittsburgh.

200 tons, up to 20-inch, heating, Rikers' Island penitentiary, New York, to Bethlehem Steel Co., Bethlehem, Pa.; C. H. Darmstadt Inc., general contractor.

## Cast Pipe Pending

7000 feet, cast iron soil pipe, Panama canal; bids June 8.

5700 tons, 6 to 12-inch for Chicago, Glamorgan Pipe & Foundry Co., and Alabama Pipe Co., Birmingham, Ala., Lynchburg Foundry Co., Lynchburg, Va., and James B. Clow & Sons, Chicago, low bidders at $39.90 to $40.80, delivered.

1900 tons, 12-inch pipe for Detroit.

750 tons, 30 and 36-inch pipe and large fittings for Racine, Wis., James B. Clow & Sons, low at $47,000.

500 tons, 6 to 12-inch, for Yorktown Heights, New York.

300 tons, 8-inch, for Yonkers, N. Y.; R. D. Wood & Co., Florence, N. J., low.

225 tons, 4 to 6-inch, for Vega, Tex.; bids in.

200 tons, various sizes, Springfield and Jamaica pumping stations, New York; Charles Meads Co., general contractor.

160 tons, 8 and 12 inch, for Fall River, Mass.; bids to close May 26.

150 tons, 10-inch, for Gardner, Mass.; bids next month.

## Steel Pipe Pending

15,000 tons, 20-inch, Pennsylvania-New York line, for Lycoming Natural Gas Co., subsidiary of Standard Oil Co. of New Jersey; award expected soon.

700 tons, 48-inch steel pipe, department of water supply, gas and electricity, New York, Oakhill Contracting Co., New York, low on general contract.

# Wire

**End of Fence Season Brings Decline in Demand—Prices Are Under Pressure at Minimums**

WIRE PRICES, PAGE 87

**Pittsburgh**—Activity in wire products continues to decline slowly. New buying still is restricted by fairly heavy orders placed late in March and shipments also are affected. Quiet building operations are reflected in slow demand for nails and manufacturers' wire is moving in lighter volume to meet industrial consumers. Fencing and barbed wire are passing their active season. Prices are easier with 2.30c disappearing on plain wire. Nails are no higher than $1.90 to the jobbers and occasional sales are made at $1.80.

**Worcester, Mass.**—Production is shading off gradually, with little change in the general situation. The market is sliding easily into the summer level but so far demand is fairly steady and the drop at no time has been sharp. Second quarter shipments are not expected to show much falling off. Meanwhile prices remain unsatisfactory.

**Philadelphia**—Nails are $1.90 a keg, Pittsburgh, which is being shaded on small lot business. Wire is easy at 2.20c, Pittsburgh.

**Buffalo** — Wireworks continue to utilize 75 per cent of their open-hearth capacity to keep pace with orders. Shipments of welded mesh for road construction are brisk and additional tonnage or large size is schedules for early covering.

**Cleveland**—Volume of wire products moving continues at the satisfactory level of the past several weeks. Mill operations locally are in step with the character of consumer demand, which is unlike its moderate needs for other steel products. Plain wire continues to move well into manufacturing plants and the country jobbing outlets for fencing and other wire products take good-sized amounts. Prices remain unchanged with 2.20 to 2.30c the quotable market on plain wire; $1.90 and $2.00 a keg on nails and semifinished $35 to $37. Most releases are at the inside figures.

**Chicago** — Following the recent mild gain in jobber orders for common wire products, both jobber and dealer buying has quieted. The woven fencing season is largely past. Common wire prices show no change at $1.95 to $2.05, Chicago or western mills, for wire nails, and 2.25c to 2.35c for plain wire. Manufacturers' wire schedules for the first half of June are expected to be equal to April and May. Manufacturers' wire is meeting expectations, but week-to-week demand is variable.

# Obituaries

(*Concluded from Page* 30)

ating in mechanical engineering from the University of Pennsylvania in 1899 he obtained further training in an engineering corporation in Nicetown, Pa. He then organized Dodge & Day, engineers, which later became Day & Zimmermann Inc. He was made president in 1916 and chairman in 1926.

□ □ □

Samuel W. Parr, 74, emeritus professor of applied chemistry, University of Illinois, died May 16, at his home in Urbana, Ill. He was widely known for his work in applied chemistry, and his process for coking Illinois coal. Professor Parr also discovered the alloy "illium," and was noted for his Parr peroxide calorimeter for measuring the heating value of coal and hydrocarbons.

□ □ □

H. F. Noyes, 50, vice president in charge of manufacturing operations for Victor Chemical Works, Chicago, died suddenly May 8, in New York. Born in Auburndale, Mass., he was graduated from Massachusetts Institute of Technology in 1904. He spent ten years with mining, iron and steel industries and then was eight years in Australia as works manager and blast furnace superintendent. In 1922 he became general manager of LaFollette Coal & Iron Co., where he remained for three years. Early in 1925 he went with Victor Chemical Works as Chicago works manager.

□ □ □

Victor E. Edwards, 68, inventor and former vice president, chief engineer and director of Morgan Construction Co., Worcester, Mass., died May 16, at his home in West Boylston, Mass. Ill health forced his retirement three years ago. Most noteworthy of his inventions was the flying shear, permitting the cutting of rails, rods, etc., while in motion. Prior to his Morgan Construction connection he was assistant chief engineer for Merrimack Mfg. Co., Lowell, Mass. He also had held that office with Washburn & Moen Co., Worcester, and at one time was with Otis Steel Co., Cleveland.

# Raw Material Prices

## Pig Iron

**Per Gross Ton**

**FOUNDRY, NO. 2**

| | |
|---|---|
| Chicago furnace | $17.50 |
| Pittsburgh, dist. fur. | 17.50 |
| Pittsburgh, delivered | 18.13 to 18.63 |
| Valley furnace | 17.00 |
| Cleveland fur., local del. | 17.00 |
| Philadelphia, delivered | 17.26 |
| Virginia, furnace | 17.75 |
| Granite City, Ill., fur. | 17.50 |
| Buffalo, fur., local del. | 17.50 |
| Buffalo, del. Boston | 21.41 to 21.91 |
| Buff., all-rail, Brooklyn | 19.91 to 20.91 |
| Buff., all-rail Newark | 18.28 to 18.78 |
| Ala., Bir. fur., local del. | 12.00 to 13.00 |
| Alabama, del. Chicago | 17.01 |
| Alabama, del. St. Louis | 15.42 |
| Alabama, del. Cincinnati | 14.69 to 15.19 |
| Ala., Phila., dock del. | 16.25 |
| Ala., Balt., dock del. | 16.00 |
| Alabama, New York dock | 16.50 |
| Ala., Boston dock del. | 16.75 |
| Tenn., Bir. base, local del | 13.00 |
| Tennessee, del. Cinn. | 14.69 to 15.19 |
| Montreal, delivered | 23.50 |
| Toronto, delivered | 22.10 |

**FOUNDRY, NO. 2X**

| | |
|---|---|
| Buffalo, fur., local del. | 17.50 |
| Buff., all-rail, Brooklyn | 20.91 to 21.41 |
| Buffalo, all-rail Newark | 18.78 to 19.28 |
| Buffalo, del. Boston | 21.91 to 22.41 |
| Virginia furnace | 18.25 |
| Eastern, del. Phila. | 17.76 |

**FOUNDRY, NO. 1X**

| | |
|---|---|
| Buffalo fur., local del. | 18.50 |
| Eastern, del. Phila. | 18.26 |

**MALLEABLE**

| | |
|---|---|
| Valley furnace | 17.00 |
| Cleveland fur., local del. | 17.00 |
| Pittsburgh dist. fur. | 17.50 |
| Pittsburgh, delivered | 18.13 to 18.63 |
| Chicago, furnace | 17.50 |
| Buffalo fur., local del. | 17.50 |
| Eastern Penna., delivered | 18.26 to 20.91 |
| Granite City, Ill., fur. | 17.50 |
| Montreal, delivered | 24.00 |
| Toronto, delivered | 22.60 |

**BASIC**

| | |
|---|---|
| Pittsburgh, district fur. | 17.50 |
| Pittsburgh, delivered | 18.13 to 18.63 |
| Eastern Penn., del. | 17.00 to 17.25 |
| Buffalo fur., local del. | 17.00 |
| Montreal, delivered | 20.50 |
| Valley, furnace | 17.00 |

**BESSEMER**

| | |
|---|---|
| Valley furnace | 17.00 |
| Pittsburgh, delivered | 18.13 to 18.63 |
| Pittsburgh, furnace | 17.50 |

**LOW PHOS.**

| | |
|---|---|
| Valley fur., standard | 27.00 |
| Philadelphia, standard | 24.76 to 27.79 |
| Copper-bear., E. Pa. fur. | 22.50 to 23.00 |

**GRAY FORGE**

| | |
|---|---|
| Valley furnace | 16.50 |
| Pittsburgh district fur. | 17.00 |
| Pittsburgh, delivered | 17.63 to 18.13 |

**CHARCOAL**

| | |
|---|---|
| Lake Superior, del. Chi. | 27.04 |

**SILVERY**

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

**BESSEMER FERROSILICON**

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$26; 16—$35.

## Coke

**Prices Per Net Tons**

**Beehive Ovens**

| | |
|---|---|
| Connellsville furnace | $2.40 to 2.50 |
| Connellsville foundry | 3.25 to 4.75 |
| New River foundry | 6.00 |
| Wise county foundry | 4.25 to 5.00 |
| Wise county furnace | 3.50 to 4.25 |

**By-Product Foundry**

| | |
|---|---|
| Newark, N. J., del. | 9.00 to 9.40 |
| Chicago, ovens | 7.50 |
| New England, del. | 11.00 |
| St. Louis, del. | 9.00 |
| Birmingham, ovens | 5.00 |
| Indianapolis, del. | 8.25 |
| Ashland, Ky., ovens, Connell., basis | 5.50 |
| Portsmouth, O., ovens, Connell., basis | 5.50 |
| Buffalo, ovens | 8.00 to 8.50 |
| Detroit, ovens | 8.00 |
| Philadelphia, del. | 9.00 |

## Iron Ore

**LAKE SUPERIOR ORE**

**Gross ton, 51½%, Lower Lake Ports**

| | |
|---|---|
| Old range bessemer | $4.80 |
| Mesabi bessemer | 4.65 |
| Old range nonbessemer | 4.65 |
| Mesabi nonbessemer | 4.50 |
| High phosphorus | 4.40 |

**EASTERN LOCAL ORES**

**Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces**

| | |
|---|---|
| Foundry and basic, 56-63%, contract | 10.00 |
| Copper-free low phos. 58-65% | nom. |

**FOREIGN ORE**

**Cents per units, alongside docks Atlantic ports**

| | |
|---|---|
| Foreign manganiferous ore, 45-55% iron, 6-10% manganese | 10.00 |
| North African low phosphorus | 9.00 |
| Swedish basic, 65% | 9.00 |
| Swedish low phos. | 10.00 |
| Spanish, North African basic, 50 to 60% | 9.00 |
| Newfoundland fdy., 55%... | 9.00 |
| Tungsten, spot and future short ton unit, duty paid | $11.25 to $11.50 |
| Chrome ore, 48% net ton c.i.f. | $21.50 to 22.00 |

## Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

| | |
|---|---|
| Caucasian, 52-55% (nom.) | 26 to 28 cents |
| South African, 52% | 26 to 28 cents |
| South African, 49-51% | 25 to 26 cents |
| South African, 44-47% | 24 cents |
| Indian, 48-50% | nom. |
| Brazilian, 46-48% (nom.) | 22 cents |

## Refractories

**FIRE CLAY BRICK**

**Per 1000 f.o.b. Works**

**First Quality**

| | |
|---|---|
| Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland | $40.00 |
| Georgia, Alabama | 40.00 |

**Second Quality**

| | |
|---|---|
| Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland | 35.00 |
| Georgia, Alabama | 30.00 to 35.00 |

**SILICA BRICK**

| | |
|---|---|
| Pennsylvania | 40.00 |
| Joliet, Ill., East Chicago, Ind. | 49.00 |
| Birmingham, Ala. | 50.00 |

**MAGNESITE BRICK**

**Per Net Ton**

| | |
|---|---|
| 9 x 4½ x 2½ | $65.00 |

**MAGNESITE**

| | |
|---|---|
| Dead burned grain, net ton, Chester, Pa., or Baltimore bases | 40.00 |
| Domes, Chewelah, Wash., base | 22.00 |

**CHROME BRICK**

| | |
|---|---|
| Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½ | 45.00 |

## Semifinished Steel

**PRICES PER GROSS TON**

**BILLETS AND BLOOMS**

**4 x 4-inch base**

| | |
|---|---|
| Pittsburgh, open-hearth | $30.00 |
| Pittsburgh, bessemer | 30.00 |
| Youngstown | 30.00 |
| Cleveland | 30.00 |
| Philadelphia | 35.30 |
| Chicago | 31.00 |
| Forging, Chicago | 36.00 |
| Forging, Pittsburgh | 35.00 to 36.00 |
| Forging, Philadelphia | 40.30 |

**SHEET BARS**

| | |
|---|---|
| Pittsburgh | 29.00 to 30.00 |
| Youngstown | 29.00 to 30.00 |
| Cleveland | 29.00 to 30.00 |
| Chicago | 30.00 to 31.00 |

**SLABS**

| | |
|---|---|
| Pittsburgh | 30.00 |
| Youngstown | 30.00 |
| Cleveland | 30.00 |

**WIRE RODS**

| | |
|---|---|
| Pittsburgh, Cleveland | 35.00 |
| Chicago | 38.00 |

**SKELP**

| | |
|---|---|
| All grades, Pittsburgh | 1.60c |

## Ferroalloys

**(In dollars, except Ferrochrome)**

| | |
|---|---|
| *Ferromanganese, 78-82%, tidewater, duty paid | $85.00 |
| *Ferromanganese, del. Pittsburgh | 89.79 |
| Spiegeleisen, 19-20%, domestic fur. spot† | 30.00 |
| Ferrosilicon, 50 per cent, freight all., c. l. | 83.50 |
| Do, less carload | 88.50 |
| Do, 75 per cent | 130.00 to 150.00 |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con., del. | 11.00 |
| Do, for spot delivery | 11.50 |
| Ferrotungsten, stand., lb. cont. | 1.10 to 1.15 |
| Ferrovanadium, 30-40 per cent, per lb., contained, on analysis | 3.15 to 3.65 |
| Ferro-carbon-titanium carload producers' plants, net ton | 150.00 |
| Do, one-ton to c. l. | 170.00 |
| Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent) | 91.00 |
| Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24% | 122.50 |

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

## Fluorspar

**85 and 5 per cent grade**

| | |
|---|---|
| Washed gravel Kentucky and Illinois mines, per net ton | $13.50 to 14.00 |
| Washed gravel, import duty paid east, tide, gross ton | 19.00 |

STEEL
Out of the rolling mill come our buildings and bridges, our ships, our railroad facilities, our automobiles, our incredible machinery. Every phase of modern activity is dependent upon Steel. The importance of this basic material makes its source of supply of vital concern to users.
Carnegie Steel Company is admirably fitted, both in experience and manufacturing facilities, to efficiently care for your steel requirements. For nearly three-quarters of a century the name "Carnegie" has been identified with Quality Steel Products.
CARNEGIE STEEL COMPANY - PITTSBURGH
Subsidiary of United States Steel Corporation
CARNEGIE

# Pig Iron

**Market Is Quieter, Though Prices Show Little Change—South Chicago Stack Blown Out**

PIG IRON PRICES, PAGE 98

**Pittsburgh**—Demand for pig iron generally remains at its recent quiet rate, except that some consumers are taking slightly more iron. Sanitary ware and radiator producers have increased their requirements moderately, although total shipments show little change. New business is dull and smaller than the volume of shipment, indicating a decreae in the movement in the near future. Inquiry is lacking. Prices are nominal and unchanged.

**Boston**—The melt remains at a low ebb and some shipments due on contracts are being deferred. Sales and inquiries are so few and small that prices are practically untested.

**New York**—Pig iron sales totaled approximately 3000 tons in small lots during the past week. Inquiry is negligible. Prices are unchanged and untested. Buffalo iron is $15 to $16, furnace, for shipment into this district; Pennsylvania iron, $16 to $16.50, furnace, and southern iron, $11, furnace. Specialty shops are laying in a little stock in anticipation of requirements later, when warmer weather will make operations more difficult. Jobbing foundries appear to be operating less actively, at 40 per cent and under.

**Philadelphia** — Demand for pig iron is dull and comprised mainly of carload lots. Prices are unchanged.

**Buffalo**—District inquiry for pig iron is improved, with a fair volume of business for quick shipment. Buffalo producers are not getting orders from the East. Barge canal shipments are less than 10 per cent of those in the same period last year. The district price is steady at $17, base, furnace.

**Youngstown, O.**—Shipments of pig iron continue unchanged. Sales are small. Stocks at important steelworks are accumulating as open-hearth activities slowly decline. No. 2 foundry, malleable, bessemer and basic hold at $17, valley.

**Cleveland**—Pig iron shipments are holding at approximately the April rate, one merchant producer reporting a slight increase over April, and others noting little change. New orders are small and for early shipment. Furnace interests with headquarters at Cleveland had one of the most unsatisfactory weeks, from the standpoint of sales, in several months, the total dropping to 9000 from 13,000 tons in week preceding. The Westinghouse Electric & Mfg. Co.'s inquiry for requirements at Cleveland and Trafford City, Pa., has been pending for more than two weeks, with no indication when it will be closed. Small lots of No. 2 foundry and malleable continue to bring $17, base, furnace, for delivery in Cleveland, while lake furnace prices range from $16 to $17 in competitive territory, including western and southern Ohio and Indiana.

**Cincinnati**—Sales of pig iron in this district during the past week totaled not more than 1500 tons. Foundry schedules are low. Reports here indicate a Buffalo furnace has reached into this territory with low quotations. Inquiries are light; an Indiana melter is in the market for 500 tons of northern iron.

**Chicago**—Merchant furnace production in this district has been reduced by blowing out B furnace of the Federal group in South Chicago. Extensive repairs will be made to this furnace and it will be out at least a month. Three merchant stacks in this district now are active. Shipments in the first half of May were chiefly to the automotive industry, and only a few hundred tons below the amount in the comparable period in April. Moderate spot buying for the remainder of this month might place the month's deliveries ahead of April. About 2000 tons of silvery iron was sold in western Michigan in two lots. Silvery prices are expected to be irregular while eastern stocks remain unsold at Chicago docks. Northern iron is steady at $17.50, base furnace.

**St. Louis**—Shipments of pig iron continue at the same rate as noted for several weeks but new orders have decreased to a few carloads in a week, for the entire district. Melters are waiting, as furnace stocks are increasing, though prices have not yet reflected these influences. Some job foundries have received good orders while others are idle.

**Birmingham, Ala.**—Sales are lagging, with production in excess of shipments. The number of active blast furnaces is unchanged, but some makers switch frequently from foundry to basic and back again. Reports are current that one maker sold a large tonnage of foundry iron in the past week, but lack confirmation.

**Toronto, Ont.**—Demand for merchant pig iron is falling off. Sales in the past week dropped below the average for the past two months, and inquiries are negligible. Producers are trying to clean up stocks, though prices are not being sacrificed.

## Ferroalloys Quiet; Demand Lowest Since January

Ferroalloy Prices, Page 98

**New York**—The movement of ferromanganese is at the lowest rate since early this year, when the steel industry was recovering from the December lull. Practically all shipments are on contracts. The spot price of $85, duty paid, for carloads is receiving little test. Domestic spiegeleisen, 19 to 21 per cent, is $30, furnace, in carloads. Spot business is negligible. Demand for foreign spiegeleisen is quieter with prices on 26 to 28 per cent material nominal.

Shipments of special ferroalloys are light but prices are unchanged. Tungsten ore is dull, with quotations sometimes heard below $3.25 a short ton unit, $11.25 duty paid. Some asking prices are slightly higher.

**Pittsburgh**—Shipments of ferroalloys remain fairly steady at an extremely low rate. Specifications for ferromanganese and spiegeleisen show little change over the past few weeks, despite a general downward trend over a larger period. Prices are unchanged, with ferromanganese $89.79, delivered, and spiegeleisen $30, furnace, both quotations applying on small lots.

## Bolts, Nuts, Rivets Hold Fairly Steady Pace

Bolts, Nuts, Rivets Prices, Page 87

**Pittsburgh**—Bolt, nut and rivet demand shows little change but continues slightly better than a month ago. The volume of business so far in May has been fairly steady although orders continue in small lots and tonnage is at a low level. Operations hold around 35 to 40 per cent. Prices remain fairly steady with business generally on the basis of 73 off for bolts and nuts, and 2.75c, Pittsburgh, for large rivets.

**Chicago**—Operations have dropped slightly below 40 per cent. Shipping orders are spotty, and are expected to be less than in April. Structural rivets remain at 2.85c, Chicago, in carload lots, and discounts for nuts and bolts are 73 off. No improvement is expected from the implement industry for two or three months.

March orders for oil burners totaled 4608 units, compared with 3708 for Febrnary.

# Scrap

**General Yielding of Prices Is Continuous in All Markets—Collections Are Slower**

**Chicago**—Yielding to depressed sentiment and further short selling, heavy melting steel has dropped another 25 cents and other scrap grades have declined. Much railroad scrap is hanging over the market, but machinery for collection of country scrap and material for small local yards has been impaired. Chicago & North Western railroad sold only a portion of its May offering because of low prices, and Chicago & Eastern Illinois railroad has withheld 40 carloads. Speculating for the decline, interests are taking advantage of the quiet prospects for steelworks and foundry consumption in the immediate foreground. Occasional small yard collections are released through forced liquidation, while larger preparation yards are buying little from outlying

# Iron and Steel Scrap Prices

**Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.**

### HEAVY MELTING STEEL

| | |
|---|---|
| Birmingham | $8.00 to $9.00 |
| Boston, dealers | 5.25 to 5.50 |
| Buffalo, No. 1 | 10.00 to 10.50 |
| Buffalo, No. 2 | 8.50 to 9.00 |
| Chicago | 8.50 to 9.00 |
| Cinci., deal. | 8.25 to 8.75 |
| Cleve., No. 1 | 9.75 to 10.00 |
| Cleve., No. 2 | 9.25 to 9.50 |
| Det., No. 1 deal. | 8.00 to 8.50 |
| Det., No. 2 deal. | 6.50 to 7.00 |
| E. Pa. del. mill | 9.00 to 10.00 |
| N. Y. deal. R. R. | 5.50 to 6.50 |
| N. Y. deal. No 2 | 450 to 500 |
| N. Y. deal. yd. | 5.00 |
| Pitts., No. 1 | 11.00 to 11.50 |
| St. L. No. 1 sel. | 8.50 to 9.00 |
| Federal, Ill. | 8.00 to 8.50 |
| Granite City, Ill. | 7.50 to 8.00 |
| Valleys, No 1 | 10.25 to 10.75 |

### COMPRESSED SHEETS

| | |
|---|---|
| Buffalo, dealers | 8.50 to 9.00 |
| Chicago | 7.00 to 7.50 |
| Cleveland | 8.50 to 8.75 |
| Detroit, dealers | 7.50 to 8.00 |
| E. Pa. new mat. | 9.00 to 10.00 |
| Pittsburgh | 10.75 to 11.25 |
| Valleys | 10.00 to 10.50 |

### BUNDLED SHEETS

| | |
|---|---|
| Buffalo | 6.00 to 6.50 |
| Cinci., deal | 7.75 to 8.25 |
| Cleveland | 7.00 to 7.25 |
| Eastern Pa. | 8.00 to 8.50 |
| Pittsburgh | 8.50 to 9.00 |
| St. Louis | 5.50 to 6.00 |

### SHEET CLIPPINGS LOOSE

| | |
|---|---|
| Chicago | 4.00 to 4.50 |
| Cincinnati | 4.75 to 5.25 |
| Detroit, dealers | 4.25 to 4.75 |
| St. Louis | 5.50 to 6.00 |

### STEEL RAILS SHORT

| | |
|---|---|
| Birmingham | 10.00 to 11.00 |
| Boston, dealers | 4.00 to 5.50 |
| Buffalo | 13.00 to 13.50 |
| Chicago (3 ft.) | 10.50 to 11.00 |
| Chicago (2 ft.) | 11.25 to 11.75 |
| Cinci., deal. | 13.00 to 13.50 |
| Detroit, deal. | 11.50 to 12.00 |
| Pitts. (open-hearth, 3 ft and less) | 14.00 to 14.50 |
| St. Louis | 12.00 to 12.50 |

### STOVE PLATE

| | |
|---|---|
| Birmingham | 7.00 to 8.00 |
| Boston, con. | 5.00 to 5.50 |
| Buffalo | 7.75 to 8.25 |
| Chicago, net | 7.00 to 7.50 |
| Cinci., deal. net | 4.50 to 5.00 |
| Det., net deal. | 5.00 to 5.50 |
| Eastern Pa. | 8.00 to 8.50 |
| N. Y., deal. mill | 4.75 |
| St. Louis | 7.00 to 7.50 |

### COUPLERS, SPRING

| | |
|---|---|
| Buffalo | 12.50 to 13.00 |
| Chicago | 10.00 to 10.50 |
| Eastern Pa. | 14.00 to 14.50 |
| Pittsburgh | 14.00 to 14.50 |
| St. Louis | 8.75 to 9.25 |

### ANGLE BARS—STEEL

| | |
|---|---|
| Chicago | 9.75 to 10.25 |
| St. Louis | 8.00 to 8.50 |

### LOW PHOSPHORUS

| | |
|---|---|
| Buff., billets and bloom crops | 14.00 to 14.50 |
| Cleveland bil. and bloom crops | 13.50 to 14.00 |
| Eastern Pa. | 15.50 to 16.00 |
| Pittsburgh billet bloom crops | 16.00 to 16.50 |
| Pitts. sheet bar crops | 14.00 to 14.50 |

### FROGS, SWITCHES

| | |
|---|---|
| Chicago | 9.00 to 9.50 |
| St. Louis | 9.00 to 9.50 |

### SHOVELING STEEL

| | |
|---|---|
| Chicago | 8.50 to 9.00 |
| Cleveland | 6.25 to 6.75 |
| St. Louis | 8.00 to 8.50 |

### RAILROAD WROUGHT

| | |
|---|---|
| Birmingham | 8.00 to 8.50 |
| Boston, dealers | 8.00 to 8.50 |
| Buffalo, No. 1 | 8.00 to 8.50 |
| Buffalo, No. 2 | 10.00 to 10.50 |
| Chicago, No. 1 | 8.25 to 8.70 |
| Chicago, No. 2 | 8.50 to 9.00 |
| Cinci., No. 2 | 8.25 to 8.75 |
| Eastern Pa. | 11.00 |
| N. Y., No. 1, deal. | 9.00 to 9.50 |
| Pitts., No. 2 | 11.00 to 11.50 |
| St. Louis, No. 1 | 6.00 to 6.50 |
| St. Louis, No. 2 | 8.00 to 8.50 |

### SPECIFICATION PIPE

| | |
|---|---|
| Boston | 5.00 to 5.25 |
| Eastern Pa. | 11.50 to 12.00 |
| N. Y., deal | 6.00 to 6.50 |

### BUSHELING

| | |
|---|---|
| Buffalo, No. 1 | 8.50 to 9.00 |
| Chicago, No. 1 | 7.00 to 7.50 |
| Cinn., No. 1 dl. | 6.75 to 7.25 |
| Cinn., No. 2 | 4.00 to 4.50 |
| Cleve., No. 2 | 6.00 to 6.50 |
| Det., No. 1 new deal. | 6.50 to 7.00 |
| St. L., No. 1 | 6.00 to 6.50 |
| Val. new No. 1 | 9.25 to 9.75 |

### MACHINE TURNINGS

| | |
|---|---|
| Birmingham | 5.50 to 6.00 |
| Boston, dealers | 1.50 to 1.75 |
| Buffalo | 4.75 to 5.00 |
| Chicago | 3.50 to 4.00 |
| Cinn., deal. | 4.50 to 5.00 |
| Cleveland | 5.25 to 5.50 |
| Detroit | 3.00 to 3.50 |
| Eastern Pa. | 6.00 to 6.50 |
| N. Y., deal. | 3.00 |
| Pittsburgh | 6.50 to 7.00 |
| St. Louis | 3.50 to 4.00 |
| Valleys | 6.00 to 6.50 |

### BORINGS AND TURNINGS For Blast Furnace Use

| | |
|---|---|
| Boston | 1.75 to 2.00 |
| Buffalo | 5.50 to 6.00 |
| Cinn., deal. | 4.50 to 5.00 |
| Cleveland | 6.25 to 6.75 |
| Detroit, deal. | 3.50 to 4.00 |
| Eastern Pa. | 6.00 to 6.50 |
| N. Y., deal. | 3.00 |
| Pittsburgh | 7.50 to 8.00 |

### CAST IRON BORINGS

| | |
|---|---|
| Birming., chem. | 12.50 to 13.00 |
| Birming., plain | 5.50 to 6.00 |
| Boston, chem. | 7.00 to 8.50 |
| Boston, deal. | 1.50 to 1.75 |
| Buffalo | 5.50 to 6.00 |
| Chicago | 3.50 to 4.00 |
| Cinn., deal. | 4.50 to 5.00 |
| Cleveland | 6.25 to 6.75 |
| Detroit, deal. | 3.50 to 4.00 |
| Eastern Pa. | 6.50 to 7.00 |
| E. Pa., chem. | 13.50 to 14.00 |
| N. Y., deal. | 3.00 |
| Pittsburgh | 7.50 to 8.00 |
| St. Louis | 5.00 to 5.50 |

### PIPE AND FLUES

| | |
|---|---|
| Cinn, deal. | 7.00 to 7.50 |

### RAILROAD GRATE BARS

| | |
|---|---|
| Buffalo | 6.50 to 7.00 |
| Chicago, net | 6.00 to 6.50 |
| Cincinnati | 5.50 to 6.00 |
| Eastern Pa. | 8.00 to 8.50 |
| N. Y., deal. | 5.00 to 5.50 |
| St. Louis | 6.00 to 6.50 |

### FORGE FLASHINGS

| | |
|---|---|
| Boston, deal | 5.00 to 5.25 |
| Buffalo | 9.00 to 9.50 |
| Cleve. ov. 10 in. | 7.25 to 7.75 |
| Detroit | 6.00 to 6.50 |

### FORGE SCRAP

| | |
|---|---|
| Boston, del. | 5.00 to 5.25 |
| Chicago | 11.50 to 12.00 |
| Eastern Pa. | 10.00 to 10.50 |

### ARCH BARS, TRANSOMS

| | |
|---|---|
| Chicago, net | 10.50 to 11.00 |
| St. Louis | 9.75 to 10.25 |

### AXLE TURNINGS

| | |
|---|---|
| Boston, deal. | 6.75 to 7.00 |
| Buffalo | 8.75 to 9.25 |
| Chi., steelworks | 7.50 to 8.00 |
| Cleveland | 8.00 to 8.50 |
| Eastern Pa. | 10.50 to 11.00 |
| Pittsburgh | 9.25 to 9.75 |
| St. Louis | 7.00 to 7.50 |

### STEEL CAR AXLES

| | |
|---|---|
| Birmingham | 12.50 to 13.00 |
| Boston, ship. pt. | 11.00 to 12.00 |
| Buffalo | 15.50 to 16.00 |
| Chicago | 13.45 to 14.00 |
| Eastern Pa. | 18.50 to 19.50 |
| St. Louis | 12.00 to 12.50 |

### SHAFTING

| | |
|---|---|
| Bos., ship. pt. | 10.00 to 10.50 |
| Chicago | 9.55 to 10.10 |
| N Y., deal. | 12.00 to 13.00 |
| St. Louis | 10.25 to 10.75 |
| E. Penna. | 18.00 |

### CAR WHEELS

| | |
|---|---|
| Birming., iron | 10.00 to 10.50 |
| Boston, iron | 14.00 to 14.50 |
| Buffalo, iron | 11.75 to 12.25 |
| Buffalo, steel | 12.25 to 12.75 |
| Chicago, iron | 9.25 to 9.75 |
| Chil. rolled steel | 11.00 to 11.50 |
| Cincinnati, iron | 10.50 to 11.00 |
| E. Pa. steel | 13.00 |
| E. Pa. iron | 12.50 to 13.00 |
| Pitts., iron | 11.50 to 12.00 |
| Pitts., steel | 14.00 to 14.50 |
| St. Louis, iron | 7.00 to 7.50 |
| St. Louis, steel | 10.00 to 10.50 |

### NO. 1 CAST SCRAP

| | |
|---|---|
| Birmingham | 9.00 to 10.00 |
| Buffalo (mach.) | 10.25 to 10.75 |
| Boston, textile | 10.00 to 10.50 |
| Chicago, mach. | 9.80 to 10.35 |
| Chi., railroad | 8.70 to 9.25 |
| Chicago, agri. | 8.40 to 8.95 |
| Cinn., mach. cup, gross | 12.25 to 12.75 |
| Cleve. cupola | 12.00 to 12.50 |
| Det., net deal. | 8.50 to 9.00 |
| E. Pa. cupola | 12.50 to 13.00 |
| N. Y. cup deal. | 8.00 to 8.50 |
| N. Y., del. local foundries | 12.00 |
| Pitts., cupola | 11.50 to 12.00 |
| San Fran., del. | 13.50 to 14.00 |
| Seattle | 7.50 to 8.00 |
| St. L. No. 1 ma. | 9.00 to 9.50 |
| St. L. No. 1 | 8.50 to 9.00 |

### HEAVY CAST

| | |
|---|---|
| Boston | 10.50 to 11.00 |
| Bos. mach. cast. | 11.50 to 12.50 |
| Buffalo, break | 7.00 to 7.50 |
| Cleve., break | 6.50 to 7.00 |
| Detroit, auto, net deal. | 10.50 to 11.00 |
| Det., break., dl. | 6.50 to 7.00 |
| Eastern Pa. | 11.00 |
| N. Y. No. 1 dl. | 7.25 to 7.75 |
| N. Y. break. dl. | 7.00 to 7.50 |
| Pittsburgh | 8.50 to 9.50 |

### MALLEABLE

| | |
|---|---|
| Boston R. R. | 13.00 to 13.50 |
| Buffalo | 11.00 to 11.50 |
| Chicago, agri. | 9.00 to 9.50 |
| Chicago, R. R. | 9.50 to 10.00 |
| Cinn., R. R. dl. | 11.00 to 11.50 |
| Cinn., agri., dl | 1100 to 1150 |
| Cleveland, rail | 12.00 to 12.50 |
| Det. auto deal. | 10.50 to 11.00 |
| St. Louis, rail | 8.00 to 8.50 |

### RAILS FOR ROLLING 5 feet and over

| | |
|---|---|
| Birmingham | 10.50 to 12.00 |
| Boston | 7.50 to 8.00 |
| Buffalo | 10.50 to 11.00 |
| Chicago | 11.00 to 11.50 |
| Eastern Pa. | 12.50 to 13.00 |
| New York | 7.75 to 8.25 |
| St. Louis | 10.25 to 10.75 |

### LOCOMOTIVE TIRES

| | |
|---|---|
| Chicago, cut | 11.50 to 12.00 |
| St. L., No. 1 | 10.50 to 11.00 |

### LOW PHOS. PUNCHINGS

| | |
|---|---|
| Chicago | 10.75 to 11.25 |
| Buffalo | 13.50 to 14.00 |
| Eastern Pa. | 14.50 to 15.00 |
| Pittsburgh | 14.50 to 15.00 |

# ACME

## Hot and Cold Rolled Strip
## Nirosta Chrome Nickel Strip
## Electro Galvanized Strip

••••

## Long Length Coils
## or Cut-to-Length

**ACME STEEL COMPANY**

*General Offices:* 2832-40 Archer Avenue .. Chicago

BROOKLYN DETROIT MILWAUKEE SAN FRANCISCO

# STEEL

44

collectors on offers below accumulating and carrying costs. More distress cars are finding their way back to yards.

**Boston**—There is no change in the dull situation in the scrap market, conditions being at a practical standstill. Some material went to Worcester again, that source not being entirely out of the market as yet.

**New York**—Scrap prices continue to sag. Buying is light and some dealers have temporarily stopped collections. Movement of No. 1 and No. 2 melting steel to Buffalo is slowing, the Lackawanna interest having taken most of recent shipments. Steel was bought for Coatesville, Pa., at $9, delivered. Some shading of this figure for eastern Pennsylvania is reported from New Jersey shipping points. Dealers' buying prices for cast iron car wheels, No. 1 machinery cast, heavy breakable cast, rails for rolling, specification pipe, foundry stove plate, skeleton and No. 1 railroad wrought are lower. No. 1 railroad steel is also easy, as low as $5.50 being reported.

**Pittsburgh**—Prices of steel and iron scrap are steadier in a quiet market. Demand for heavy melting steel is dull, with quotations nominal at $11 to $11.50 and mills displaying little interest in buying. Compressed sheets are off 25 cents at $10.75 to $11.25. Heavy breakable cast is in better demand, recent sales ranging from $8.50 to $9.50. Blast furnace and railroad specialty grades both are easier, due to lack of buying.

**Philadelphia**—Further reductions have been made in prices of steel and iron scrap. Bethlehem Steel Co. has bought 1000 tons of No. 1 steel at $9 for delivery to Sparrows Point, a decline of 50 cents. Bethlehem has lowered its buying price 50 cents on unprepared scrap at New York, to $4 shipping point. A Harrisburg consumer has bought a moderate tonnage of stove plate and grate bars at $8, delivered, down 50 cents. A Florence, N. J., consumer has bought 1000 tons of heavy breakable cast at $10.50, also 50 cents lower. A Pencoyd, Pa., consumer has taken a small tonnage of No. 2 steel at $7.50.

Lukens Steel Co. again is holding up shipments of scrap to its works.

**Buffalo**—Principal consumers have again reduced their offers for scrap. Bethlehem is reported now offering $8.50 for No. 2 heavy melting and $10 for No. 1. These are the lowest prices quoted here in many years. Other grades are sympathetically lower. A sale of machine shop turnings has been made at a price netting the dealer less than $5.25, Buffalo.

Bethlehem Steel Co. has bought 3000 tons of No. 1 heavy melting steel for rail shipment to Lackawanna at $10, delivered, making the second reduction of 25 cents within a few days.

**Cleveland**—The local subsidiary of the United States Steel Corp. is reported to have placed an order for a moderate tonnage of strictly No. 1 heavy melting steel at between $10.50 and $11. Some material for this order is moving from local yards. A large independent continues to take heavy melting steel and blast furnace scrap on a storage basis. Turnings are moving steadily to another consumer on an order recently placed. Demand for foundry grades of scrap shows a slight improvement. Quotations here remain unchanged but largely nominal despite weakening in nearby markets. Valley quotations have declined about $1 a ton with No. 1 steel now $10.25 to $10.75 and compressed sheets $10 to $10.50.

**Detroit**—Further declines have been made in quotations on blast furnace and steelmaking grades of steel and iron scrap. In the face of apathy on the part of buyers the situation is weak.

**Cincinnati**—Weakness in iron and steel scrap, noted last week, is reflected in lower dealer quotations, with heavy melting steel off 50 cents, at $8.25 to $8.75. Buying is light and shipments against orders have not improved.

**St. Louis**—New business in iron and steel scrap is confined to orders for a few carlots of specialties for fill-in purposes and to complete mixtures. Purchasing of real tonnages is lacking, and inquiry is almost entirely absent.

**Birmingham, Ala.**—New business is irregular, with total tonnage low.

**Toronto, Ont.**—Canadian iron and steel scrap has fallen into listless inactivity. Demand for steel scrap is practically at a standstill, with only small tonnages going forward to consumers in the Hamilton district. Iron scrap is also slowing down in demand, although consumers still take shipments of machinery cast against contract and pick up odd lots.

## Canadian Scrap

**Dealers' Buying Prices**

**MONTREAL**

**Per Gross Ton**

| | |
|---|---|
| Iron axles | $11.00 |
| Steel axles | 10.00 |
| Car wheels | 8.00 |
| Stove plate | 8.00 |
| Wrought pipe | 2.00 |
| Turnings | 2.00 |
| Heavy melting steel | 6.00 |

**TORONTO**

| | |
|---|---|
| Steel axles | 7.00 |
| Iron axles | 7.00 |
| Heavy melting steel | 7.00 |
| Turnings | 2.00 |
| No. 1 mach. cast (net) | 9.00 |
| Malleable (net) | 7.00 |

# Coke

**Beehive Furnace Fuel More Generally Offered at $2.40—Demand for All Grades Quiet**

COKE PRICES, PAGE 98

**Pittsburgh**—Beehive coke activity is quiet and little changed from recent weeks. Shipments on old orders are fairly steady for both foundry and furnace grades. Furnace coke is more available at $2.40, with some sales still noted at $2.50. The foundry grade continues $3.25, minimum.

**Boston**—Contract shipments of foundry coke are being deferred, and the market is dull.

**New York**—Beehive furnace coke continues $2.25c, Connellsville, Pa., and standard grades of beehive foundry coke, $3.25, Connellsville. Premium brands are $4.70 to $4.85, Latrobe, Pa. Demand appears as light as at any time this year. By-product coke is $9 to $9.40, Newark, N. J., $11, New England; and $9, Philadelphia. Production of by-product coke has been further curtailed, reflecting slow metallurgical demand and seasonal reduction in buying for domestic purposes.

**Cincinnati**—Shipments of by-product foundry coke continue irregular, some demands holding fairly well. Wholesale quotations on domestic grades are to be advanced 25 cents on June 1.

**St. Louis**—Shipments of by-product coke to consumers in this district during the first half of May exceeded those of the last half of April. Specifications indicate this rate will be maintained during the remainder of the month. The movement of industrial coke has dropped to a new low point.

**Birmingham, Ala.**—Further reduction in demand for foundry coke has led to a slight reduction in the rate of oven operations, and a few units have been taken off. Prices are steady.

# Pacific Coast

**Canadian Interests Believe Dullness Will Last Through Year—British and French Pipe Competes with Canadian—Great Northern Railroad Lets Railroad Steel Tonnage**

**Vancouver, B. C.**—While there has been a fair volume of turnover in steel products since the first of the year, manufacturers and wholesalers see little promise of active business during the remainder of 1931. One of the largest fabricating plants reports that up to 30 days ago, the current year was ahead of the same period of 1930 but prospects are now flat and it is expected 1931 will not show better than two-thirds of the volume of 1930. The reinforcing business is only about 40 per cent of last year's volume. Old materials are slow and while there is some movement of cast iron scrap, large stocks of steel scrap are on hand. There is no export movement and steel scrap demand locally is absent.

## Coast Pig Iron Prices

| | |
|---|---|
| Utah basic | $22.00 to 24.00 |
| Utah foundry | 22.00 to 24.00 |
| *German | 24.25 |
| *Indian | 22.00 to 24.00 |

*C.i.f. duty paid.

Greater Vancouver has purchased considerable cast iron pipe recently, Canadian makers getting the preference while British and French materials have had a share. American pipe is practically unable to compete.

Two bridge projects are contemplated. The Second Narrows span, Vancouver, to replace a structure damaged by a steamer last year, is still undecided. This project will involve 700 tons of shapes. The Ashcroft bridge over the Thompson river, B. C., also proposed but not yet up for figures, will require 500 tons. The city will receive bids June 2 for 11,000 feet of 24 and 30-inch steel water pipe, about 500 tons.

Western Bridge Co. Ltd. is completing its contract for 925 tons of structurals for the Canadian National Steamships pier, replacing a new terminal destroyed by fire last summer. The same plant is fabricating 600 tons for Pacific Great Eastern railroad bridge.

Dominion Bridge Co. Ltd. with the Western Bridge Co. Ltd., is fabricating 3200 tons of steel for the Burrard bridge, Vancouver, which also involves 2000 tons of reinforcing. Erection of steel will begin in August. Dominion Bridge Co. Ltd. is erecting 1200 tons of structurals for the Lilooet bridge. The same plant also has contracts for 350 tons of shapes for the three girder span bridge for the Pacific Great Eastern and 310 tons of structurals and 50 tons of machinery for the C. & R. railroad bridge over the Fraser river at Lulu Island.

Vancouver Engineering Works Ltd. is fabricating 35,000 feet of electrically welded steel pipe, 1800 tons, for the water line extension to New Westminster. Steel plate from England is being used for the first time. The contract is now half completed. The same shops have completed 20 tons of steel castings for the Burrard bridge.

### Trade Volume Subnormal

Wholesale jobbers report competition extremely keen and price conditions unsatisfactory. Reinforcing materials are slow, merchant bars are somewhat more active but sheets and other materials are in poor demand. Volume of business is considerably below normal. Building operations have dropped and the trade feels the effect.

Evans, Coleman & Evans, Vancouver, have contracted to furnish Vernon, B. C., with 200 tons of 10 and 12-inch Canadian Delavaud cast iron pipe, to be furnished out of stock. This firm has 1500 tons of Canadian pipe en route by water from the North Atlantic to arrive this week. This shipment has been sold to various British Columbia municipalities.

Scrap dealers will not consider steel scrap at any price as it is not moving. For No. 1 machinery, cupola size, cast iron they are offering from $10 to $12 a net ton but demand is not active. There is good inquiry for reconditioned pipe of various sizes.

## Railroad Tonnage Is Let

**Seattle** — The largest railroad tonnage placed in the Pacific Northwest in several months was awarded this week by the Great Northern railroad in connection with its extension from Oregon to California. Pacific Coast Steel Corp., Seattle, took 4000 tons of tie plates while 500 tons of track spikes will be furnished by the Pacific Coast Forge Co., Seattle.

Seattle is in the market for approximately 600 tons of rails and plates for the city municipal line. For the Eighth avenue N. W. extension bids will be opened this week for 43,600 feet of 70-pound new or No. 1 relayer rail, 504 tons, also 24 tons of tie plates. Bids will be received May 22 for 80 tons 140-pound Lorain girded guard rails and 7 tons of plates for stock.

### Pipe Projects Are Active

Elliott, Stroud Bros. & Seabrook, San Francisco, have been awarded at $384,359 the contract for constructing the West Seattle reservoir, requiring a small tonnage of riveted steel pipe and miscellaneous steel items. In about 30 days the Mountain Lakes Water Co., which has a franchise to serve a large suburban territory between Seattle and Everett, will call for bids. This project involves more than 50 miles of pipe. There will be 24 miles of wood stave and steel pipe, 24 to 42 inches in diameter. Aberdeen, Wash., has awarded the contract for 3.8 miles of water pipe, adopting wood stave, eliminating steel pipe, estimated tonnage 1600 tons. Diameter is 28 inches.

American Cast Iron Pipe Co., through R. C. Polk, Seattle agent, has closed for 150 tons of 6 to 12-inch for various local projects.

## Horses Still Need Steel

New York—Horses, once no mean consumers of iron and steel in the now motorized cities, contribute little to the total annual tonnage, although per capita horse requirements may be holding up. New York, however, is in the market for horseshoers' supplies and takes bids May 25 on 2700 pounds of horseshoe tips, 2500 pounds of horseshoes, 500 pounds horseshoe nails and 350 pounds steel caulking. These supplies are for the police department, mounted forces.

Various army posts recently took bids on approximately 200,000 shoes for horses and mules.

## Arsenal Steel Is Bought

New York—Crucible Steel Co. has been awarded contract for 110,000 pounds of steel, 2-inch diameter, for the Watertown, Mass., arsenal on a bid of 2.2c. For the Picatinny arsenal, N. J., Harvey Metal Corp., Chicago, has been awarded 1325 brass forgings at 13.5c.

# Steel, Wrought and Cast Iron Pipe, and Tubing

## Welded Iron, Steel Pipe

**Base Price $200 Ton**

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

**BUTT WELD**

| | Steel | | | Iron | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk | Gal. |
| ⅛ | 58 | 44½ | ⅛ | 23 | 5 |
| ¼ | 62 | 50½ | ¾ | 28 | 11 |
| ¾ | 64 | 52½ | 1 and 1¼ | 31 | 15 |
| 1—3 | 64 | 52½ | 1½ and 2 | 35 | 18 |

**LAP WELD**

| | | | | | |
|---|---|---|---|---|---|
| 2 | 57 | 45½ | 2 | 23 | 9 |
| 2½—6 | 61 | 49½ | 2½—3½ | 28 | 13 |
| 7—8 | 58 | 45½ | 4—6 | 30 | 17 |
| 9—10 | 56 | 43½ | 7 and 8 | 29 | 16 |
| 11—12 | 55 | 42½ | 9—12 | 26 | 11 |

**BUTT WELD**

*Extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ | 55 | 44½ | ¼ & ⅜ | +13 | +48 |
| ¼ | 60 | 49½ | ½ | 23 | 7 |
| ¾ | 62 | 51½ | ¾ | 28 | 12 |
| 1—1½ | 62 | 51½ | 1—2 | 34 | 18 |
| 2—3 | 63 | 52½ | | | |

**LAP WELD**

*Extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 55 | 44½ | 2 | 29 | 13 |
| 2½—4 | 59 | 48½ | 2½—4 | 34 | 20 |
| 4½—6 | 58 | 47½ | 4½—6 | 33 | 19 |
| 7—8 | 54 | 41½ | 7 and 8 | 31 | 17 |
| 9—10 | 47 | 34½ | 9—12 | 21 | 8 |
| 11—12 | 46 | 33½ | | | |

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized. Direct mill shipments, base minus two 5's.

**BOILER TUBES**

| Carload Discounts, Lap Welded Steel | | f.o.b. Pittsburgh Charcoal Iron | |
|---|---|---|---|
| 2—2¼ | 38 | 1¾ | 8 |
| 2½—2¾ | 46 | 2—2¼ | 13 |
| 3 | 52 | 2½—2¾ | 16 |
| 3¼—3¾ | 54 | 3 | 17 |
| 4 | 57 | 3¼—3½ | 18 |
| 4½—6 | 46 | 4 | 20 |
| 1½ | 1 | 4½ | 21 |

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

**STANDARD COMMERCIAL SEAMLESS BOILER TUBES**

**COLD DRAWN**

| | | | |
|---|---|---|---|
| 1 | 61 | 3 | 46 |
| 1¼—1½ | 53 | 3¼—3½ | 48 |
| 1¾ | 37 | 4 | 51 |
| 2—2¼ | 32 | 4½, 5, 6 | 40 |
| 2½—2¾ | 40 | | |

**HOT ROLLED**

| | | | |
|---|---|---|---|
| 2—2¼ | 38 | 3¼—3½ | 54 |
| 2½—2¾ | 46 | 4 | 57 |
| 3 | 52 | 4½, 5, 6 | 46 |

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Tubing

**Cold drawn; f.o.b. mill**

Random lengths over 5 ft. .....55%
Selected lengths, 1 to 18 ft. .....53%

## Cast Iron Water Pipe

**Class B Pipe—Per Net Ton**

Six-inch and over, Bir. ....$35.00 to 36.00
Four-inch, Birmingham .... 39.00 to 40.00
Four-inch, Chicago ..... 45.00 to 47.00
Six to 24-inch, Chicago..... 42.00 to 44.00
Six-inch and over, N. Y..... 35.50 to 37.50
Four-inch, New York ..... 39.50 to 40.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

# Warehouse Quotations at Leading Centers, in Cents Per Pound

**STEEL BARS**

| | |
|---|---|
| Baltimore | 3.00c |
| Boston | 3.265c |
| Buffalo | 3.15c |
| Chattanooga | 3.10c |
| Chicago | 2.90c |
| Cincinnati | 3.15c |
| Cleveland | 2.75c |
| Detroit | 2.85c |
| Houston | 3.00c |
| Los Ang. | 3.40c |
| New York‡(d) | 3.10c |
| Philadelphia | 2.60c |
| Pittsburgh | 2.75c |
| Portland | 3.15c |
| San Frans. | 2.40c |
| Seattle | 3.00c |
| St. Louis | 3.15c |
| St. Paul | 3.00c |
| Tulsa | 3.65c |

**IRON BARS**

| | |
|---|---|
| Baltimore | 3.25c |
| Boston | 3.265c |
| Buffalo | 3.15c |
| Chattanooga | 3.10c |
| Chicago | 3.00c |
| Cincinnati | 3.15c |
| Detroit | 3.00c |
| New York‡(d) | 3.10c |
| Philadelphia | 2.60c |
| St. Louis | 3.15c |
| Tulsa | 3.65c |

**REINFORC. BARS**

| | |
|---|---|
| Baltimore | 2.50c-3.31c |
| Boston | 3.265c |
| Buffalo | 2.95c |
| Chattanooga | 3.10c |
| Cincinnati | 3.15c |
| Cleveland | 2.25c-2.44c |
| Detroit | 2.85c |
| Houston | 3.00c |
| Los Ang. cl. | 2.40c |
| Los Ang. lcl. | 2.70c |
| New York | 2.65c-3.10c |
| Phila. | 2.40c-3.00c |
| Pittsburgh | 2.75c |
| San Fran. cl. | 2.30¢ |
| San Fran. lcl. | 2.50c |
| Seattle | 3.00c |
| St. Louis | 3.15c |
| Tulsa | 3.65c |
| Young. | 2.30c-2.60c |

**SHAPES**

| | |
|---|---|
| Baltimore | 3.00c |
| Boston | 3.365c |
| Buffalo | 3.25c |
| Chattanooga | 3.20c |
| Chicago | 3.00c |
| Cincinnati | 3.25c |
| Cleveland | 2.95c |
| Detroit | 3.10c |
| Houston | 3.25c |
| Los Ang. | 3.40c |
| New York(d) | 3.10c |
| Philadelphia | 2.50c |
| Pittsburgh | 2.85c |
| Portland | 3.15c |
| San Fran. | 2.40c |
| Seattle | 3.00c |
| St. Louis | 3.25c |
| St. Paul | 3.10c |
| Tulsa | 3.75c |

**PLATES**

| | |
|---|---|
| Baltimore | 3.00c |
| Boston | 3.365c |
| Buffalo | 3.25c |
| Chattanooga | 3.20c |
| Chicago | 3.00c |
| Cincinnati | 3.25c |
| Cleveland, ¼-in. and thicker | 2.95c |
| Clev., 3/16-in. | 3.20c |
| Detroit | 3.10c |
| Det., 3/16-in. | 3.10c |
| Houston | 3.00c |
| Los Angeles | 3.40c |
| New York(d) | 3.30c |
| Philadelphia | 2.50c |
| Phila. floor | 5.10c |
| Pittsburgh | 2.85c |
| Portland | 3.15c |
| San Fran. | 2.40c |
| Seattle | 3.00c |
| St. Louis | 3.25c |
| St. Paul | 3.10c |
| Tulsa | 2.75c |

**NO. 10 BLUE**

| | |
|---|---|
| Baltimore | 3.25c |
| Boston | 3.915c |
| Buffalo | 3.50c |
| Chattanooga | 3.60c |
| Chicago | 3.35c |
| Cincinnati | 3.45c |
| Cleveland | 3.00c |
| Detroit | 3.35c |
| Houston | 3.90c |
| Los Ang. | 3.95c |
| N. Y. (d) | 3.00c-3.40c |
| Portland | 4.00c |
| Phila.*† | 3.05c |
| Pitts.** | 3.10c |
| San Fran. | 3.65c |
| Seattle | 3.75c |
| St. Louis | 3.45c |
| St. Paul | 3.40c |
| Tulsa | 3.95c |

**NO. 24 BLACK**

| | |
|---|---|
| Balt.*† | 3.50c |
| Boston | 4.70c |
| Buffalo | 4.20c |
| Chicago | 3.80c |
| Cincinnati | 3.90c |
| Cleveland | 3.60c |
| Detroit | 3.50c |
| Los Ang. | 4.70c |
| New York | 3.50c-3.65c |
| Phila.*† | 3.50c |
| Pitts.** | 3.35c to 3.40c |
| Portland | 4.50c |
| San Fran. | 4.15c |
| Seattle | 4.25c |
| St. Louis | 3.95c |
| St. Paul | 3.545c |
| Tulsa | 4.10c |

**NO. 24 GAL. SHEETS**

| | |
|---|---|
| Balt.*† | 4.00c |
| Boston | 5.45c |
| Buffalo | 4.40c-4.60c |
| Chicago (local del.) | 4.35c |
| Chicago (outside) | 4.35c-4.60c |
| Cincinnati | 4.40c |
| Cleveland | 4.00c |
| Detroit | 4.00c |
| Houston | 5.40c |
| Los Ang. | 5.10c |
| New York | 4.00c-4.10c |
| Phila.*† | 3.95c |
| Pitts.** | 3.90c to 4.00c |
| Portland | 5.00c |
| San Fran. | 4.65c |
| Seattle | 4.75c |
| St. Louis | 4.40c |
| St. Paul | 4.23c |
| Tulsa | 4.60c-4.75c |

**BANDS**

| | |
|---|---|
| Baltimore | 3.50c |
| Boston | 4.015c-5.00c |
| Buffalo | 3.50c |
| Chattanooga | 3.30c |
| Chicago | 3.10c |
| Cincinnati | 3.35c |
| Cleveland | 3.00c |
| Det. 3/16-in. & lighter | 3.15c |
| Houston | 3.65c |
| Los Ang. | 4.30c |
| New York(d) | 3.40c |
| Philadelphia | 2.90c |
| Pittsburgh | 3.10c |
| Portland | 3.50c |
| San Fran. | 3.75c |
| Seattle | 3.50c |
| St. Paul | 3.75c |
| Tulsa | 3.85c |

**HOOPS**

| | |
|---|---|
| Baltimore | 3.50c |
| Boston | 5.50c-6.00c |
| Buffalo | 3.90c |
| Chicago | 3.65c |
| Cincinnati | 3.90c |
| Cleveland | 3.55c |
| Det. No. 14 & lighter | 3.65c |
| New York | 3.75c |
| Philadelphia | 3.15c |
| Pittsburgh | 4.10c |
| Seattle | 4.90c |
| St. Paul | 3.75c |

**COLD FIN. STEEL**

**Rounds & Hexagons**

| | |
|---|---|
| Baltimore (c) | 3.30c |
| Boston | 3.50c |
| Buffalo | 3.15c |
| Chattanooga* | 3.85c |
| Chicago | 3.35c |
| Cincinnati | 3.80c |
| Cleveland | 3.40c |
| Detroit | 3.65c |
| Los Ang. (a) | 4.50c |
| New York | 3.40c |
| Philadelphia* | 3.40c |
| Pittsburgh | 3.35c |
| Portland (a) | 4.50c |
| San Fran.(a) | 4.25c |
| Seattle (a) | 4.50c |
| St. Paul (a) | 3.85c |
| St. Louis | 3.60c |
| Tulsa | 4.75c |

Flats and squares 5½c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

**COLD ROLL. STRIP**

| | |
|---|---|
| Boston 0.100 in., 500 lb. lots | 5.30c |
| Buffalo | 5.65c |
| Chicago (soft) (b) | 6.15c |
| Cincinnati | 6.10c |
| Clev. (b) | 5.55c |
| Detroit | 5.40c |
| Phila. (c) | 4.85c |
| New York | 4.55c |

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.

# THE ROCK DRILLS THAT BROKE DOWN BECAUSE THEIR BOLTS FAILED

## A problem in fatigue

## and incalculable stresses solved by R B & W Engineering Service

A construction machinery corporation, the titan in its field, sent us, over a period of time, a series of orders for bolts—each new order designating higher tensile strength material. Our inquiry developed the fact that the bolts were used in pneumatic rock drills, and were failing in service from fatigue and incalculable stresses.

The R B&W Engineering Service took up the problem. Our metallurgist, in co-operation with our customer's metallurgical department, selected a metal and a heat treatment for the rock drill bolting material which provided the necessary strength and ductility to stand up under the extraordinary stress conditions that prevailed when the product was in use.

The selection of satisfactory bolting material involves much more than size, fit, finish and price. If you are having bolt trouble, or would like to know whether a new plan would lessen costs and increase efficiency, write the R B & W Engineering Service. No obligation.

**RUSSELL, BURDSALL & WARD BOLT & NUT CO.**

PORT CHESTER, N. Y. ROCK FALLS, ILL. CORAOPOLIS, PA.

*Sales offices at* Philadelphia, Detroit, Chicago, San Francisco, Los Angeles, Seattle, Portland, Ore.

## Mill Products

**Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 9.00c, Conn., for copper**

| | |
|---|---|
| **Sheets** | |
| Yellow brass (high) | 16.25 |
| Copper, hot rolled | 18.87½ |
| Lead, full sheets (cut ½c more) | 7.75 |
| Zinc sheet (100-lb. base) | 8.75 |
| **Tubes and Pipes** | |
| Seamless yellow brass (high) | 21.12½ |
| Seamless copper | 21.37½ |
| **Rods** | |
| Yellow brass (high, full turnings) | 14.50 |
| Naval brass | 15.50 |
| **Anodes** | |
| Copper, untrimmed | 16.37½ |
| **Wire** | |
| Yellow brass (high) | 16.75 |

## Old Metals

**Dealers' buying prices, cents lb.**

| | |
|---|---|
| **Heavy Red Brass** | |
| New York | 5.50 to 5.75 |
| Chicago | 5.25 to 5.37½ |
| Cleveland | 5.00 to 5.50 |
| St. Louis | 5.75 |
| **Heavy Yellow Brass** | |
| New York | 3.75 to 4.00 |
| **Heavy Copper and Wire** | |
| New York | 6.75 to 7.00 |
| Boston | 6.25 to 6.50 |
| Chicago | 6.25 to 6.50 |
| Cleveland | 5.50 to 6.00 |
| St. Louis | 6.00 to 6.25 |
| **Red Brass Borings** | |
| New York | 5.25 to 5.50 |
| **Yellow Brass Tubing** | |
| Cleveland | 3.00 to 3.50 |
| **Light Copper** | |
| New York | 5.75 to 6.00 |
| Chicago | 5.00 to 5.25 |
| Cleveland | 4.50 to 5.00 |
| St. Louis | 5.50 |
| **Light Brass** | |
| Boston | 2.50 to 2.75 |
| Chicago | 3.00 to 3.12½ |
| Cleveland | 2.25 to 2.50 |
| St. Louis | 3.00 to 3.25 |
| **Zinc** | |
| New York | 1.25 |
| Cleveland | 0.75 to 1.00 |
| St. Louis | 1.25 |
| **Aluminum** | |
| Clippings, soft, Cleveland | 11.00 to 12.50 |
| Clippings, hard Cleveland | 8.50 to 9.00 |
| Borings, Cleveland | 4.00 to 4.50 |
| Mixed cast, Cleveland | 4.50 to 5.00 |
| Mixed cast, Boston | 4.00 to 4.50 |
| Mixed cast, St. Louis | 4.50 |

## Secondary Metals

| | |
|---|---|
| Remelt aluminum No. 12 | 10.00 |
| Brass ingots, 85-5-5-5 | 8.75 |

# Metals

**Zinc Prices Firm Up Slightly but Copper Settles to One Level—Tin Quotations Fairly Steady**

**New York**—Zinc prices have firmed up slightly during the past week while copper has shown no net change on actual sales. Other metal sales have been quiet.

Brass and copper product prices have been cut ¼-cent in each of two reductions to a basis of 9.00c for copper. Custom smelters have been at the 9-cent level for two or three weeks, and actual domestic sales have been at this price, but producers did not meet it until Monday. Shipments of mill products in April were larger than in any other recent month. It appears likely that May shipments will be considerably reduced.

**Copper**—Domestic business has continued quiet. Export sales, however, increased to 3000 tons on Monday at the new low price of 9.27½c, c.i.f. European ports. Firmness or weakness from this point appears to depend on whether export sales continue good. There is little hope that domestic business will show much sustaining power. Foreign users are believed to be not so well covered as domestic. Current prices have been equalled only once previously in the history of the domestic mining industry.

**Zinc**—Recovery in prime western prices this past week was due primarily to ore market firmness. Consumers have shown some additional interest but buying has not been stimulated materially by the rise. The ore market has been unchanged at $20 a ton. Because of low prices, mining companies have been unwilling to sell more than a meager tonnage, while smelters have wanted to buy moderately.

**Tin**—Remarkable steadiness has prevailed during the past few weeks despite small demand. An international committee of producers has recommended to governments of producing countries that output be curtailed an additional 20,000 tons a year, making total curtailment about 58,000 tons or 32 per cent compared with 1929 output. Tin price jumped immediately to 24.25c on reports of the curtailment agreement. There was no corresponding improvement in demand, however, and later prices eased off.

**Lead**—Prices have been unchanged though buying has continued light.

**Aluminum**—New business is quiet and prices of new metal are unchanged. High grade remelt is steady, but No. 12 is weak.

## Coke By-Product Sales Sustained; Prices Steady

**New York**—Toluol demand continues slightly ahead of April shipments, the lacquer trade sustaining the volume. Current production of distillates about equals demand. Stocks in consumers' hands have been gradually worked off. Low alcohol prices have resulted in some buying of that commodity instead of benzol. Prices are unchanged. The market tone in phenol is slightly improved.

## Coke By-Products

**Per Gallon, Producers' Plants, Tank Lots**

| | Spot |
|---|---|
| Pure benzol | $0.19 to 0.20 |
| 90 per cent benzol | 0.19 to 0.20 |
| Toluol | 0.27 to 0.29 |
| Solvent naphtha | 0.25 |
| Commercial xylol | 0.25 |
| **Per Pound at Producers' Plants in 250-Pound Drums** | |
| Phenol | 0.16 to 0.17 |
| **Per Pound at Producers' Plants** | |
| Naphthalene flakes | 3.75 to 4.75 |
| Naphthalene balls | 4.75 to 5.75 |
| **Per 100 Pounds Atlantic Seaboard** | |
| Sulphate of ammonia | $1.80 to $1.90 |

## Quicksilver More Active

**New York**—Quicksilver is unchanged and moderately active at $101 to $102 a flask.

## Prices of the Week, Cents a Pound

| | Copper—Electro delivered | Copper—Lake delivered | Copper—Casting refinery | Straits Tin—New York Spot | Straits Tin—New York Futures | Lead N. Y. | Lead St. L. | Zinc St. L. | Aluminum 98-99% | Antimony Spot | Nickel Ingot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| May 13 | 9.00 | 9.37½ | 8.85 | 23.25 | 23.50 | 3.75 | 3.60 | 3.32½ | 22.90 | 6.52½ | 35.00 |
| May 14 | 9.00 | 9.37½ | 8.85 | 23.35 | 23.62½ | 3.75 | 3.60 | 3.37½ | 22.90 | 6.50 | 35.00 |
| May 15 | 9.00 | 9.37½ | 8.85 | 23.40 | 23.65 | 3.75 | 3.60 | 3.35 | 22.90 | 6.50 | 35.00 |
| May 16 | 9.00 | 9.37½ | 8.85 | 23.35 | 23.60 | 3.75 | 3.60 | 3.35 | 22.90 | 6.50 | 35.00 |
| May 18 | 9.00 | 9.12½ | 8.85 | 24.12½ | 24.45 | 3.75 | 3.60 | 3.40 | 22.90 | 6.50 | 35.00 |
| May 19 | 9.00 | 9.12½ | 8.85 | 23.62½ | 23.87½ | 3.75 | 3.60 | 3.35 | 22.90 | 6.45 | 35.00 |

# Europe

**France Curtails Public Work—Soviet Orders in Germany Under Cloud—British Markets Easier**

**London**—(*By Radio*)—Gloomy reports continue to come from the principal European iron and steel producing countries. A continuation of the depression is causing much anxiety in Belgium and prices are weakening. Large public construction plans have been retrenched, further complicating an unsatisfactory situation in France. In Germany difficulties have arisen concerning recent orders from Russia, and the general outlook for business is unfavorable.

A soviet trade delegation is informing the British public that orders for 30,000 tons of hematite and tin plate have been placed with British producers.

The depression in Great Britain is unrelieved. Markets for tin plate and galvanized sheets are quiet and price reductions are expected. Continental billets are offered at £4 2s 6d ($20.65), delivered, Birmingham. Midland pig iron has been reduced 5 shillings ($1.21) per ton, and is now below the Continental price. Two hematite furnaces in the Northeast are restarting.

British iron and steel exports in April totaled 187,865, compared with 170,289 in March, and imports amounted to 193,390 tons, against 210,467 tons in March.

## British Steel Plants Idle As Business Falls Off

**Birmingham, Eng.**—In the Middlesbrough steel industry trade is dull, with increasing difficulty in keeping plant in operation. There is a little more export inquiry and April returns show an improvement although it will be difficult to maintain this unless there is further expansion. April imports of iron and steel into the Tees totaled 11,669 tons, slightly less than in the same period last year.

Barrow Hematite Steel Co. announces that owing to depression in the steel trade and lack of orders for steel rails the steel works will be closed at the end of the week, the work in hand having been completed. Rolling of hoops, strips, etc. will continue and the two furnaces producing pig iron will also remain in blast. At Workington the mills are still engaged on rolling home rails and sleeper plates and are likely to be in operation throughout this month and next. There are no alterations in prices for heavy steel.

### Pig-Casting Machines Ordered

Ashmore, Benson, Pease & Co. Ltd. have recently received from Russia important orders in connection with blast furnace plant, including two pig-casting machines. The firm is the sole British licensee for these machines which they build to the design of the Pittsburgh Coal Washer Co. They have a capacity of 120 tons of pig iron per hour. The whole of the material for these machines will be fabricated in this country.

The steel position in the Midlands shows no change of importance. No plants are running regularly and seasonal trade which should be developing in certain products is still lacking. A few specifications are coming in but they are mostly for small quantities. Structural steel is in no better request as engineers in this district are short of work.

Merchants selling Continental material are disposing of odd lots to works in the Midland area but the scale of prices is difficult to define as in some cases quotations have been cut as much as 3s 6d ($.84) owing to eagerness to secure business.

### Staffordshire Finds Competition

In South Staffordshire demand for finished iron is on a moderate scale. Prices are weakening and there is no sign of any movement toward expansion. At one works making strip business was better for about four weeks but there is now a decline and operations have been reduced accordingly. Competition is keen from other districts in regard to crown iron and outside makers are underselling the Staffordshire mills.

In his presidential address to the Iron and Steel Institute this week Sir Charles Wright dealt with the development of the Welsh tin plate in-

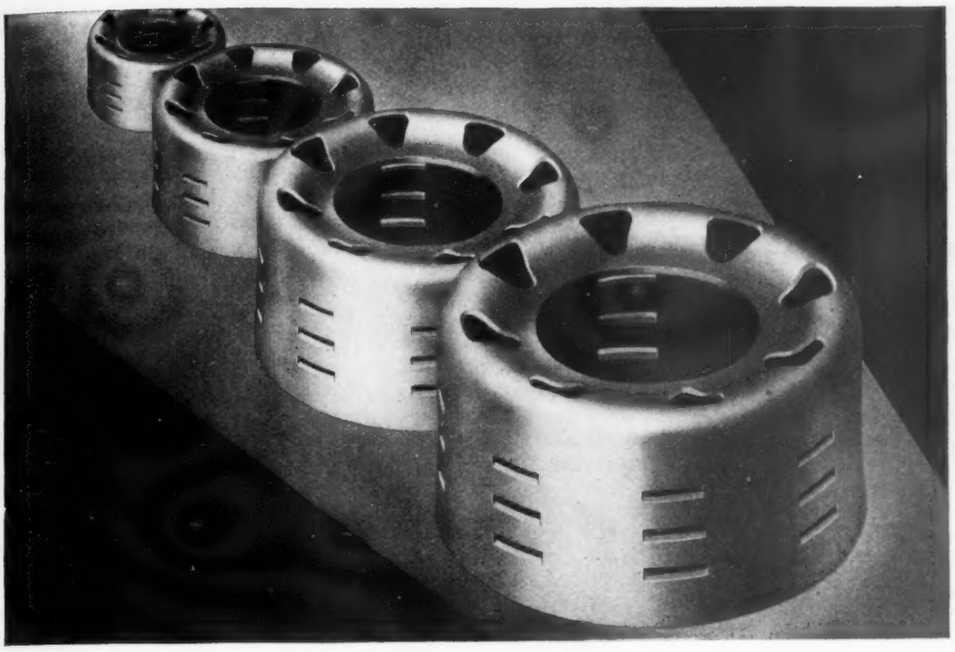
## Current Iron and Steel Prices of Europe

| Dollars at Rates of Exchange, May 18 | *British* Gross Tons U. K. Ports | | *French* Metric Tons Channel Ports | | *Belgium and Luxemburg* Metric Tons Channel Ports | | *German* Metric Tons Rotterdam or North Sea Port | |
|---|---|---|---|---|---|---|---|---|
| **Export Prices f.o.b. Ship at Port of Dispatch—By Cable** | | | | | | | | |
| **PIG IRON** | | £ s d | | £ s d | | £ s d | | £ s d |
| Foundry No. 3**..... | $14.22 | 2 18 6* | $11.79 | 2 8 6 | $11.79 | 2 8 6 | $12.15 | 2 10 0 |
| Basic-bessemer..... | 14.58 | 3 0 0 | 11.54 | 2 7 6 | 11.54 | 2 7 6 | 13.37 | 2 15 0 |
| Hematite, Phos. .02-.05 | 15.80 | 3 5 0 | ..... | ..... | ..... | ..... | 17.01 | 3 10 0 |
| **SEMIFINISHED STEEL** | | | | | | | | |
| Billets..... | $26.12 | 5 7 6 | $15.80 | 3 5 0 | $15.80 | 3 5 0 | $16.04 | 3 6 0 |
| Wire rods..... | 41.31 | 8 10 0 | 24.30 | 5 0 0 | 24.30 | 5 0 0 | 24.30 | 5 0 0 |
| **FINISHED STEEL** | | | | | | | | |
| Standard rails..... | $40.10 | 8 5 0 | $31.59 | 6 10 0 | $31.59 | 6 10 0 | $31.59 | 6 10 0 |
| Merchant bars..... | 1.68c | 7 15 0 | .80c | 3 13 0 | .80c | 3 13 0 | .86c | 3 18 0 |
| Structural shapes..... | 1.68c | 7 15 0 | .73c | 3 6 6 | .73c | 3 6 6 | .75c | 3 8 6 |
| Plates..... | 1.79c | 8 5 0 | .92c | 4 4 0 | .92c | 4 4 0 | .99c | 4 10 0 |
| Sheets, black, 24 gage | 1.90c | 8 15 0 | 1.80c | 8 4 0 | 1.80c | 8 4 0 | 1.84c | 8 7 6 |
| Sheets, gal., 24 ga. corr. | 2.71c | 12 10 0 | 2.28c | 10 7 6 | 2.28c | 10 7 6 | 2.31c | 10 10 0 |
| Bands and strips..... | 2.06c | 9 10 0 | .96c | 4 7 6 | .96c | 4 7 6 | .96c | 4 7 6 |
| Plain wire, base..... | 2.06c | 9 10 0 | 1.08c | 4 18 6 | 1.08c | 4 18 6 | 1.10c | 5 0 0 |
| Galvanized wire, base.. | 2.39c | 11 0 0 | 1.43c | 6 10 0 | 1.43c | 6 10 0 | 1.40c | 6 7 6 |
| Wire nails, base..... | 2.39c | 11 0 0 | 1.10c | 5 0 0 | 1.10c | 5 0 0 | 1.16c | 5 5 0 |
| Tin plate, box 108 lb... | $ 3.65 | 0 15 0 | ..... | ..... | ..... | ..... | $ 8.26 | 1 14 0 |

| | | | French France | | Belgian France | | Renten Marks | |
|---|---|---|---|---|---|---|---|---|
| **Domestic Prices at Works or Furnace—Last Reported** | | | | | | | | |
| Fdy. No. 3 Pig Iron** | $14.22 | 2 18 6 | $11.93 | 305(2) | $12.79 | 460 | $18.58 | 78 |
| Basic pig iron..... | 14.58 | 3 0 0 | 12.71 | 325(1) | 11.68 | 420 | 20.37 | 85.50 |
| Furnace Coke..... | 2.92 | 0 12 0 | 5.67 | 145 | 5.14 | 185 | 5.10 | 21.40 |
| Billets..... | 26.12 | 5 7 6 | 19.16 | 490 | 17.24 | 620 | 26.32 | 110.50 |
| Standard rails..... | 1.79c | 8 5 0 | 1.41c | 785 | 1.57c | 1,210 | 1.37c | 127 |
| Merchant bars..... | 1.68c | 7 15 0 | .89c | 495 | .88c | 675 | 1.38c | 128 |
| Shapes..... | 1.90c | 8 15 0 | .99c | 550 | .87c | 670 | 1.35c | 125 |
| Plates..... | 1.95c | 9 0 0‡ | 1.26c | 700 | 1.02c | 785 | 1.58c | 147 |
| Sheets, black, 24 gage | 1.90c | 8 15 0 | 2.21c | 1,225 | 1.89c | 1,450 | 1.26c | 117 |
| Sheets, gal. 24 ga., corr. | 2.39c | 11 0 0 | 2.57c | 1,425 | 2.54c | 1,950 | 3.56c | 330 |
| Plain wire..... | 2.06c | 9 10 0 | 1.98c | 1,100 | 2.08c | 1,600 | 2.24c | 207 |
| Bands and strips..... | 2.06c | 9 10 0 | 1.22c | 680 | 1.39c | 1,075 | 1.60c | 148 |

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £16 9s 0d ($79.95) delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f. o. b.; **Silicon 2.50-3.00. British quotations are for basic openhearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

# BEST PREVIOUSLY—40,000 PIECES NOW THEY HAVE RUN 100,000 AND NO SIGNS OF WEAR WITH MIDVALE



# PUNCHES

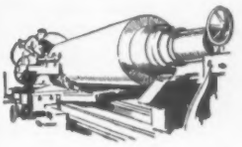
**FROM the Wedge Products, Inc., of Cleveland, comes the report on a punch made from Midvale Diamond Brand Steel. Previously the best they had been able to do was 40,000 pieces at a run. The punch made of Midvale has already run 100,000 pieces and shows no wear of any kind.**

**Midvale die steels and tool steels *must* stand up. For they are made primarily for use in Midvale's own shops, where they are put to the most severe use it is possible to exact from steel. And Midvale must meet the same requirements of prompt delivery and economical production demanded of you.**

**Whatever your steel problem, it has probably already been solved in the Midvale shops. Write or phone The Midvale Company at its nearest office: Philadelphia, New York, Washington, Pittsburgh, Cleveland, Chicago or San Francisco.**

## TOOL STEEL

**Midvale does not follow the "tonnage" method of tool steel production. Midvale charges with cold metal. Lets the ingots cool, to permit inspection for faults. Carefully chips out any cracks. Reheats ingots and reduces to billet size. Sand-blasts the scale. Again inspects and chips when necessary. Reheats and rolls to finished size. This is the only method by which tool steel of Midvale quality can be produced.**



## HEAVY MACHINING

**To meet the requirements of Midvale shop operation, Midvale tool steel is tested under the most exacting conditions any steel can be asked to meet. Gigantic pressure vessels, heavy ordnance of the toughest metal, locomotive wheels whose composition is actually that of tool steel itself — steel of every variety of alloy, work from heavy roughing to that calipered to the tenthousandth of an inch — all this is daily going through the Midvale shops — *and must go through on schedule.***

dustry. Its position, he said, was one of unaided competition in an open market. It relied for 70 per cent of its trade upon the export market. Not only had certain countries which formerly provided good markets become producers themselves, but some had become competitors in world markets. The industry could not afford to be haphazard. If it was to be dynamic it must continue to pay attention to technical research in all its branches.

In South Wales Welsh tin plate makers are accepting lower prices in order to keep mills at work. Reports are current that the Elba Tinplate works, employing nearly 1000 men, are to close down in a month's time. Prices are unchanged and range from 15s ($3.64) to 15s 6d ($3.76) basis. There is no better demand for galvanized sheets, which continue dull at £11 ($53.46) a ton, f.o.b. Swansea.

## Belgian Steelmakers Meet Many Adverse Factors

**Brussels**—The Belgian iron and steel market is dull and prices are weak, merchant bars having been sold at £3 15s ($18.20). From the point of view of the Belgian works the situation is becoming critical. On the other hand, it seems that German and Luxemburg exporters have withdrawn from the market, probably owing to substantial tonnages lately received from Russia. However, reappearance of German and Luxemburg exporters is expected before long, and it is feared this will result in a further weakening of prices.

There also is a feeling that consumers expect prices to fall off further, and for that reason are withholding their orders. There has been little activity from Far Eastern markets, and business with the Argentine Republic is reduced to nothing. The change of regime in Spain has brought about a weakening of the peseta exchange rate, which has reacted unfavorably in South America.

Continental ironmakers are seriously disturbed by increasing tonnages of Indian pig iron finding their way into Europe at prices which cannot be met profitably. However, it is reported that certain German producers have decided to cut prices sufficiently to combat this competition. Indian pig iron is quoted in Europe about 7 per cent lower than the cost of pig iron in European countries. Anxiety also is felt owing to the agitation in Great Britain with a view to protecting iron and steel products by means of a tariff. It is stated that if Great Britain renders more difficult or prohibits the entry of semifinished steel from the Continent, Continental producers will be obliged to compete more strongly in sales of finished steel in various foreign markets. It is felt that the most satisfactory solution would be to arrive at an understanding between British and Continental producers.

Foundry pig iron, 2.5 to 3 per cent silicon, now is offered at £2 9s 6d ($12) to £2 10s ($12.10) f.o.b. Antwerp, and basic bessemer pig iron at £2 7s ($11.40). Semifinished steel is dull, but prices are unchanged. Sheet bars are weak at about £3 9s ($16.75). Blooms are quoted at £3 3s ($15.30), and 2-inch billets are £3 7s ($16.15). Merchant bars are lifeless and prices have dropped by about 1s (24c) per ton. There is a lack of orders for beams and structural steel. Beams of Continental size are quoted at £3 8s ($16.55) and British sizes at £3 9s ($16.75). Wire rods are weak, and in some cases drawn wire is sold at low prices. Basic bessemer ¼-inch plates now are offered at £4 6s ($20.85).

## German Steel Gains Lost As Sellers Compete

**Berlin**—The firmer tendency registered on export markets during the first half of April has disappeared with the re-entry of the Steel Works association as a seller. Unsatisfactory domestic orders have rendered it impossible for German producers to remain out of the market for a longer period, as their order books are depleted. The report of the Vereinigte Stahlwerke for the quarter ending March 31, 1931, registered another decrease in sales to 205,100,000 marks ($49,000,000), compared with 233,700,000 marks ($56,500,000) for the last quarter of 1930 and 326,600,000 marks ($78,000,000) in the corresponding period a year before.

It is remarkable that this time export sales also have declined at a heavier rate, totaling 83,300,000 marks ($19,900,000) during first quarter of this year, against 103,800,000 marks ($24,700,000) in the preceding quarter and 121,600,000 marks ($29,000,000), a year previously. Domestic sales of the Vereinigte Stahlwerke decreased to 121,900,000 marks ($29,100,000), compared with 129,600,000 marks ($31,000,000) in the previous quarter and 205,000,000 marks ($48,900,000) in the first quarter of 1930. Unfilled orders of this combine March 31 aggregated 58.8 per cent of the monthly average of 1929-30, against 59.4 per cent during the final quarter of last year.

Foreign sales of merchant bars have proceeded at an unsatisfactory rate at about £3 18s ($18.98). Structural shapes are about £3 11s ($17.28). Exports to the Far East have been stimulated by reduction in freight rates from the Continent to the Far East, thus enabling German producers to underquote American and even Japanese offers. It is expected that orders from China will increase during the period of low freight rates, which rates, however, will hardly remain effective long.

With regard to bands, consumers have not shown much interest, prices at Hamburg being quoted at about £4 5s ($20.68). Foreign sales of wire and wire products, which had been more active during the second part of March, again have been reduced, with quotations declining. Plain wire is priced at about £5 5s ($25.54). Tin plate business has kept up well.

## France Makes Less Steel

**Paris**—Output of pig iron in France for first quarter was 2,302,000 tons, against 2,588,000 tons for the corresponding period of 1930, a decrease of 11.1 per cent.

Output of steel ingots and castings was 2,161,000 tons for first quarter, against 2,420,000 tons for first quarter of last year, a decrease of 10.7 per cent.

Output of iron ore decreased 17.1 per cent from last year. Comparisons follow, in metric tons:

| Mon. ave. | Iron ore | Pig iron | Steel ingots and castings |
|---|---|---|---|
| 1913 | 3,588,000* | 756,000* | 581,000* |
| 1928 | 4,094,000 | 832,000 | 792,000 |
| 1929 | 4,220,000 | 864,000 | 808,000 |
| 1930 | 4,038,000 | 841,000 | 783,000 |
| 1931 | | | |
| Jan. | 3,805,000 | 801,000 | 746,000 |
| Feb. | 3,397,000 | 726,000 | 693,000 |
| March | 3,540,000 | 775,000 | 722,000 |

*In present boundaries.

## French Trade Declines

**Paris**—Exports of pig iron and ferroalloys from France and the Saar in March made a total of 130,000 tons for first quarter, against 135,000 tons in the first quarter of 1930, a decrease of 3.7 per cent. Exports of steel products in March made a total for the first three months of 776,200 tons, compared with 853,900 tons in the corresponding period of last year, a decrease of 8.8 per cent.

Imports of pig iron and ferroalloys for the first three months totaled 37,000 tons, against 52,000 tons in the corresponding period of 1930, a decrease of 28.8 per cent. Imports of steel products for first quarter decreased 9.9 per cent. Comparative figures follow, in metric tons:

| | IMPORTS | | EXPORTS | |
|---|---|---|---|---|
| Mon. ave. | Pig iron and ferro-alloys | Steel* | Pig iron and ferro-alloys | Steel† |
| 1928 | 5,000 | 9,500 | 54,000 | 343,000 |
| 1929 | 4,000 | 14,000 | 48,000 | 281,000 |
| 1930 | 14,000 | 21,000 | 45,000 | 273,000 |
| 1931 | | | | |
| Jan. | 11,000 | 23,000 | 42,000 | 246,000 |
| Feb. | 14,000 | 22,000 | 44,000 | 265,000 |
| March | 12,000 | 19,000 | 44,000 | 265,200 |

The above figures include returns from the Saar district.

*Semifinished steel, plates and sheets, tin plate, steel tubes, steel scrap.

†Ingots, semifinished steel, merchant bars, structural steel, steel tubes, wheels and tires, rails, hoops and bands, wire rod and wire products, plates and sheets, tin plate, steel scrap.

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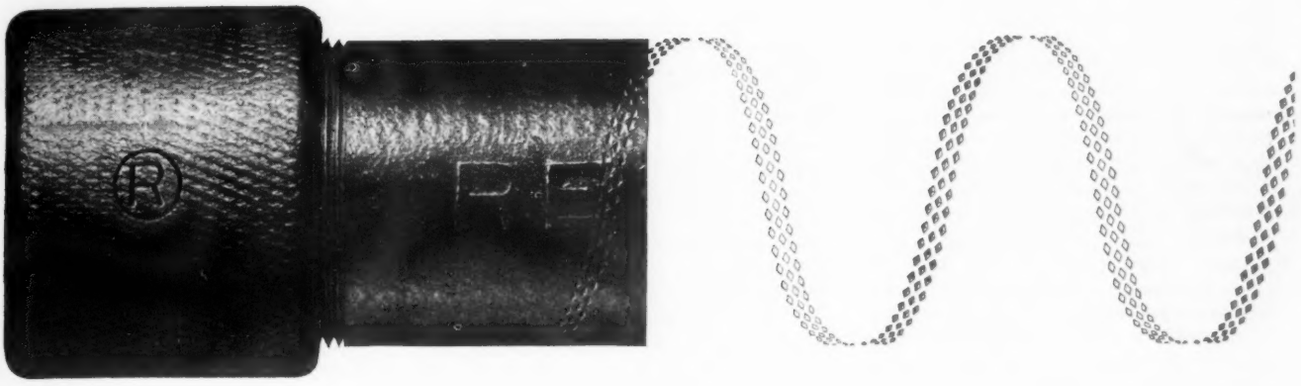

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# Machinery

BUSINESS appears quiet in nearly all important machine tool centers this week with both inquiries and orders well below the level thus far this year. Considerable pending business has been temporarily withdrawn and in many cases requirements have been cut down. A somewhat brighter situation appears in the New England territory where two orders for grinders for Russia and another for Ford of Canada have increased operations. Wider variation in quotations submitted as bids on miscellaneous lots of equipment indicate the severe competition now generally prevailing and the tendency toward decreased firmness in prices.

**New York**—Machine tool inquiry and buying continues listless. Volume of business being closed is light, limited to one or two tools at a time. New business is well below that of the first three months of the year. Early improvement is clouded by the lack of fresh inquiry. Considerable pending business on which inquiries came out in the first quarter has been temporarily withdrawn. Needs for plant expansions have slumped to a low point and replacements are generally limited to buyers who have taken spot orders and who stress early delivery. Government departments take some tools, but inquiry from this source is lighter than several weeks ago. Bids on such equipment bring out widely varying prices. Machine tool builders are generally operating with skeleton forces.

One New England builder of grinders recently booked close to 40 machines for Russia. Another sold six of a recently developed model to an automobile plant. One of the largest producers of bearings for the automotive interests in Connecticut is operating 40 hours a week. In this connection, it is noted that total output at this plant approaches 57 to 80 per cent of the production attained when the same plant was operating two shifts, this having been accomplished without addition of much new equipment, indicating that labor is extending itself more seriously.

**Worcester, Mass.**—More foreign business has appeared to sustain the machinery market. Two Worcester makers of grinders have received substantial orders from Russia, supplementing shipments already under way to England and France. In one case production is assured for several months.

Ford of Canada has placed an order for grinders and more inquiry is outstanding. Domestic demand is still lagging however, with little prospects that much in the line of inquiry will be available until fall.

Simonds Saw & Steel Co., Fitchburg, Mass., has approached some of the manufacturers requested to cancel orders for the new $1,500,000 plant, with an offer to discuss the situation and arrive at a basis of settlement. It is reported that the company's difficulties arose from the failure to move into consumption reserve stocks manufactured for delivery in the period when the company would be changing from the old plant to the new high production plant.

In other cases, however, where cancellation was refused no counter offer has been made.

**Pittsburgh**—Spring influences have had a disquieting effect upon the machinery market, business gradually becoming duller over the past 30 days. Recent awards and inquiry have declined to a low level and the outlook remains poor. Individual tools continue the rule on orders and inquiry, but the number of both is smaller than during April.

**Cleveland**—Announcement by Addressograph-Multigraph Corp. of its plans for a $1,000,000 plant in a suburb of Cleveland has done much this week to strengthen faith in the future in this vicinity. While this means no immediate equipment business, there is believed to be something to look forward to in that respect. Faith in the future also is being expressed in a tangible way by one of the large machinery dealers in this city, who is erecting a new building of considerable size.

Leading machine tool men of Cleveland are at Old Point Comfort, Va., this week in attendance at the spring convention of the National Machine Tool Builders' association. Among other things, important reports of progress are expected in connection with the association's marketing research program which was launched at the annual meeting last October.

While orders for small tools and parts maintain fair volume, machine tool orders have become fewer, and it looks as though May would be the low month thus far for this year.

**Chicago**—Possibility is seen that bids may be asked soon by the Chicago board of education on the $500,000 Lane Technical high school equipment. Bids have been tabulated for the Austin high school list, which includes 24 13-inch lathes, milling machine, shaper and shaper-planer. Reports are that the bids again may be rejected because of wide variance in the high and low bids this ranging from $18,000 to about $50,000. Also, a number of the dealers have proposed modifications in the board's specifications. It is known that at least two important industrial inquiries that had been contingent on price concessions have been withdrawn for the present. Santa Fe and Union Pacific are completing purchases against their lists, but no fresh railroad inquiry has appeared. The list of over 50 items recently issued by the St. Paul road may be cut down to less than half, and it is not likely purchases will be made for two to three months. May business is under April for the houses that have not participated in railroad orders.

## April Crane Orders Slump; Shipments Show Gain

New York—While shipments increased, new orders slumped sharply in April as compared with March, according to the Electric Overheead Crane institute. Shipments included 42 units with a tonnnage capacity of 1139 valued at $415,987.48. This compares with 34 units shipped in March with a tonnage capacity of 728½, valued at $261,063.07.

New orders in April dropped to 27 with a tonnage capacity of 618, valued at $273,573.05. This compares with 46 units, ordered in March, with a tonnage capacity of 1345, valued at $671,221.

Unfilled orders on May 1 included 95 cranes with a tonnage capacity of 3082, valued at $1,420,427.05. On April 1, there were 110 units on order with a tonnage capacity of 3603, valued at $1,551,685.

## Hoist Orders Increase

New York—Members of the Electric Hoist Manufacturers' association report the number of hoists ordered during April increased 4.526 per cent as compared with the previous month, and the value of such orders increased 4.935 per cent as compared with March.

Shipments were 25.885 per cent smaller in April than in March.

# Construction and Enterprise

## CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

### New England

CAMBRIDGE, MASS.—Massachusetts Institute of Technology is considering erection of additional laboratory units. Estimated cost, $100,000.

SWAMPSCOTT, MASS.—City plans to build a 2-story school on Forest avenue, at a cost of about $350,000. Metalworking equipment will be required. H. S. Baldwin is in charge.

WORCESTER, MASS.—Northeastern Storage & Distributing Co., J. S. Gerety manager, 93 Grafton street, will erect a warehouse terminal at Artic, Grafton and Keefe streets at an approximate cost of $900,000. Structure will be 180 x 640 feet. F. B. Hoffman, 147 East Sixty-first street, New York, is architect.

PORTSMOUTH, N. H.—Charles A. Allen, superintendent, board of public works, proposes to install motors, pumping equipment, and an electric oil heater in the municipal asphalt plant for which plans are being completed.

### New York

BROOKLYN—Plant of the Zenith Refrigerator Co. Inc., 181 Belmont avenue, recently was damaged by fire. Company makes steel containers.

BROOKLYN—Bureau of supplies and accounts, navy department, Washington, will receive bids May 26 on schedule 5700 for one four cycle diesel engine.

BROOKLYN — Empire State Iron Works has been incorporated with $5000 capital by Attorneys Albany Service Co., 299 Broadway, New York, to deal in construction materials.

BROOKLYN—Bureau of supplies and accounts, navy department, Washington, will receive bids June 2 on schedule 5757 for 25 electric portable scaling hammers.

BROOKLYN — Brooklyn & Queens Transportation Co., 385 Flatbush avenue extension, has private plans for erection of a substation at Ocean avenue and Avenue H. Cost is estimated at $40,000.

BUFFALO—Buffalo Fire Appliances Co., 44 Central avenue, will build a shop unit at a cost of about $7500.

DELMAR—Slingerlands-Elsmere Bus Line Co. plans to rebuild its bus garage and repair shop, recently damaged by fire with loss estimated at $40,000. New shop machinery and equipment will be installed.

NEW YORK—Foundry of Brass & Bronze Specialty Co., 340 Jackson avenue, recently was damaged by fire.

NEW YORK—Burgoyne Duct Machine Co. has been incorporated with $10,000 capital by A. I. Wolf, 299 Broadway, to make plumbers' supplies.

NEW YORK—General Fan Co. has been incorporated with $25,000 and 200 common shares by Charles Abrams, 233 Broadway, to make blowers.

NEW YORK—Board of transportation has awarded contracts for construction of substations at Jay and Smith streets to Reiss Construction Co., 186 Remsen street, Brooklyn, N. Y. Approximate cost, $130,000.

### New Jersey

KEYPORT—Keyport Tool & Machine Co. has been incorporated with $50,000 capital by Karkus & Karkus, to make automobile accessories.

TRENTON—C. V. Hill & Co., 360 Pennington avenue, manufacturers of refrigerators, have awarded contract for a plant, 100 x 250 feet. Estimated cost, $25,000.

### Pennsylvania

DENBO—Gulf Refining Co., Frick annex, Pittsburgh, will purchase power equipment and pumping machinery in connection with a storage and distributing station to be built here. Company engineering department is in charge. Cost is estimated at $100,000.

EASTON—Custom Casting Co. has been incorporated with 50 no par shares by Lippincott Colket, Haverford, Pa., to manufacture and deal in hardware, castings, metals and machinery. Harrison C. Colket, Bryn Mawr, Pa., and Abel P. Wetherill, Wynnewood, Pa., are interested.

KINGSTON—J. T. Evans Inc. has been incorporated with $200,000 capital by J. T. Evans, Reynolds street, to manufacture and install building materials, sheet metal and ventilating equipment.

PHILADELPHIA—Plant of the Philadelphia Conduit & Mfg. Co., Swanson and Wolf streets, recently was damaged by fire.

PHILADELPHIA—Plant of Penn Surgical Mfg. Co., 1407 North Eighth street, recently was damaged by fire, with loss estimated at $50,000. Company manufactures surgical, dental and veterinary instruments.

PITTSBURGH—National-Erie Corp. has been incorporated with $5000 capital by W. H. MacAfee, 1809 Clark building, to manufacture and deal in iron and steel.

PITTSBURGH—Pittsburgh Metal Cap & Seal Corp. has been incorporated with 4500 no par shares by M. W. Kurniker, 4403 Center avenue, to manufacture and sell caps, seals and closing devices for containers. Robert Carson, 653 Morewood avenue and C. S. Steedle, 253 Edmond street, are interested.

POTTSTOWN—Pottstown Blower Co. Inc. has been incorporated with $20,000 capital by Harry A. Norman, 715 Franklin Trust building, Philadelphia, to manufacture and distribute blowers.

POTTSTOWN—Board of directors, Hill school, will construct a power plant, plans for which have been completed. Ballinger Co., Twelfth and Chestnut streets, Philadelphia, is architect and engineer.

RIDGWAY—City plans extensions to the municipal waterworks, at an estimated cost of $80,000.

SCRANTON—Princeton Rayons Inc., 150 Madison avenue, New York, will build a machine shop, power house and other units here. Cost is estimated at $250,000.

### Ohio

CINCINNATI — Globe-Wernicke Co., Carthage avenue, Norwood, has plans for a 2-story power plant. Estimated cost, $250,000. Kinney & Ehlers Inc., Dixie Terminal building, are engineers.

CLEVELAND — Foundry Materials Inc. has been incorporated with $10,000 and 200 no par shares by Clark & Wiltse, 361 Leader building.

CLEVELAND—Metropolitan Furnace & Sheet Metal Co. has been incorporated with $12,500 capital by Edward C. Kleinman, 714 Guarantee Title building.

CLEVELAND — Addressograph-Multigraph Corp. has secured a site of 30 acres on Babbitt road in Euclid village for erection of a $1,000,000 plant for the manufacture of office machinery. Joseph E. Rogers is president and general manager. W. L. Brewer is assistant to the president of the American Multigraph Co. division, East Fortieth street and Kelley avenue. Company engineers are in charge of plans. (Noted April 2.)

NORWALK—Charles L. Frederick, 46 Foster avenue, is preparing to double capacity of his machine shop by means of a plant addition. Tractors, garden tractors, garden implements and attachments are manufactured.

TOLEDO—Constantine Casket Co., Constantine, Mich., has let contract for a 3-story plant for storage and distribution. Mills, Rhines, Bellman & Nordhoff, Ohio building, Toledo, are architects. Cost is estimated at $70,000.

TROY—City will receive bids soon for a new boiler and equipment for the municipal light and power plant. Estimated cost, $35,000.

UPPER SANDUSKY—Wyandot Machine Co. has been incorporated with 250 no par shares by J. L. Vaughan, 1020 Guardian building, Cleveland.

### Indiana

MUNCIE—American Pump & Equipment Co. Inc. has been incorporated with 1000 no par shares by Cyril F.

Hay to manufacture and deal in pumps and pumping equipment.

WINCHESTER — Culver Mfg. Co. Inc. has been incorporated with 1000 no par shares by William E. Culver and Edward M. Culver to manufacture stoves.

## Illinois

ARLINGTON HEIGHTS—City, H. G. Peter clerk, will install motor-driven deep well pumping machinery and equipment and make other improvements to the municipal water system, at a cost of approximately $50,000. Bond issue has been provided for.

CHICAGO—Airplane Fan Co., 344 North Ogden avenue, has been incorporated with $15,000 capital by Henry & Grodsky, 7 South Dearborn street, to deal in fans and ventilating equipment of all kinds.

CHICAGO—William Welch Mfg. Co., 1515 Sedgwick street, maker of scientific instruments and apparatus, is building a 4-story addition at Orleans street and North avenue. Granger & Bollenbacher, 333 North Michigan avenue, are architects.

CHICAGO—Jenson Radio Mfg. Co., 6601 South Laramie avenue, has purchased 71,000 square feet of industrial property adjacent to its present location, enlarging its holdings to include 114,000 square feet of land and 50,400 square feet of industrial buildings.

## Southern States

BIRMINGHAM, ALA.—Gledhill Road Machinery Co., E. C. Gledhill president, Galion, O., is reported to plan erection of a plant for the manufacture of road machinery. Unit will be 90 x 300 feet. Estimated cost, $150,000. W. V. Goshorn and F. W. Faber, Birmingham, are interested.

WILMINGTON, DEL.—Home Electric Furnace Heating Co. has been incorporated with $1,000,000 capital by Delaware Registration Trust Co. to deal in electric heaters and furnaces.

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids June 9 on schedule 5769 for a quantity of hand reamers of high carbon steel, to be delivered at various naval stations in the United States.

ATLANTA, GA.—Eastern Air Transport Inc., 105 Marietta street, is receiving bids for improvements, including increased shop facilities, at Candler field.

ALEXANDRIA, LA.—Alexandria Culvert Co. has been incorporated with $50,000 capital by M. B. Evans, to manufacture culverts.

SHREVEPORT, LA.—Capt. George E. Lamb, constructing quartermaster, Barksdale field, will receive bids until June 9 for one 5-ton natural draft incinerator.

CHARLOTTE, N. C.—Simplex Machine Co., box 181, whose incorporation recently was noted, advises through Ellis W. Henderson, president, that the company will market a new device for textile weaving, by means of which patterns are handled without box chains, pattern chains or multipliers. At present company has let contract for manufacture to Barkley Machine Works, Gastonia, N. C., the latter being in the market for stamping gears and brass or aluminum tubing in 5 to 6-inch diameters. No additional machinery will be required. (Noted May 14.)

MARYVILLE, TENN. — Maryville Foundry has been established by George Rutherford. Operations have been started on the former site of the McNaughton Mfg. Co. Production will include furnace parts and gray iron castings.

FAIRMOUNT, W. VA.—A. B. Knight, 117 East Park avenue, has let contract for the construction of a 50 x 67-foot addition to plant for making glass manufacturing machinery, to Adams Bros.

## Missouri

ST. LOUIS—Advance Laundry Machinery Co., 5483 Union boulevard, is reported in the market for a 25 or 30-horsepower boiler.

## Arkansas

BRIDGE JUNCTION—District Engineer, U. S. Engineer office, McCall building, Memphis, Tenn., will receive bids June 3 for 650,000 pounds of ½-inch galvanized wire strand, 750,000 pounds of ⅜-inch, 100,000 pounds of 5/16-inch and 250,000 pounds of ¼-inch wire strand, for delivery here.

EVERTON—Silica Products Co. Inc., care of D. D. Dunkin, Harrison, Ark., proposes to build a plant for the production of silica products. Private plans are being prepared. Estimated cost, $75,000.

## Oklahoma

BOISE CITY—Atchison, Topeka & Santa Fe railway, G. W. Harris chief engineer, Chicago, has let contract for an automatic electric locomotive coaling plant to Roberts & Schaeffer Co., 400 North Michigan avenue, Chicago, and for sand plant and electric cinder handling plant, to be built here. Coaling plant is to have capacity of 200 tons.

## Texas

BEAUMONT—Southern Iron & Metal Co. has been incorporated with $50,000 capital by A. Blieden, 220 Orange street, to deal in scrap metals.

FT. WORTH—Southwestern Tool Co. has been incorporated with $10,000 capital by Emil Dufek, 4054 Clark street, to manufacture oil field tools.

MINERAL WELLS—Baker Hotels Inc., Baker Hotel building, Dallas, Tex., will build a hangar, 110 x 200 feet, at the airport here. Cost, approximately $75,000.

## Wisconsin

EAU CLAIRE—Plant of Dunphy Boat Mfg. Co. recently was virtually destroyed by fire. Loss is estimated at $75,000. Company plans to rebuild.

ELKHORN — Brellenthin Truck & Shovel Co. has been incorporated with $20,000 capital by H., C. A. and E. G. Brellenthin.

HARTFORD—City council will take bids for improvement to the city sewage disposal plant. Appropriation amounts to $43,000. J. Donohue, consuulting engineer, Sheboygan, Wis., is in charge.

MILWAUKEE—Chain Belt Co., 1600 West Bruce street, has awarded contracts for construction of a 1-story plant addition, 90 x 106 feet, to its No. 3 plant at South Forty-fifth street and West Greenfield avenue. Klug & Smith, 111 East Wisconsin avenue, have plans.

OCONOMOWOC — City council has provided for additions to the city water plant, at a cost of $25,000. J. A. Stemper is city engineer.

RACINE—Qualheim Pattern & Machine Works Inc. has been incorporated with 500 no par shares by S. C. Qualheim, P. E. Jorgensen and E. L. Christensen, to deal in machinery and appliances.

## North Dakota

GRAND FORKS—E. L. Lium, city engineer, will receive bids May 27 for construction of a 2-story, 150 x 300-foot filtration plant addition. Estimated cost, $80,000.

## Idaho

BOISE—Varney Air Lines has awarded contract for construction of a hangar unit here, estimated to cost $38,000.

IDAHO FALLS—City, Harry Payne clerk, is receiving bids for furnishing one 1500 kilovolt-ampere generator and other equipment. Estimated cost $55,000.

## Kansas

ANTHONY—Machine shop has been established here at 118 South Anthony street by Bert Peters and Edward Temple. Business formerly was conducted at Wichita, Kans.

## Colorado

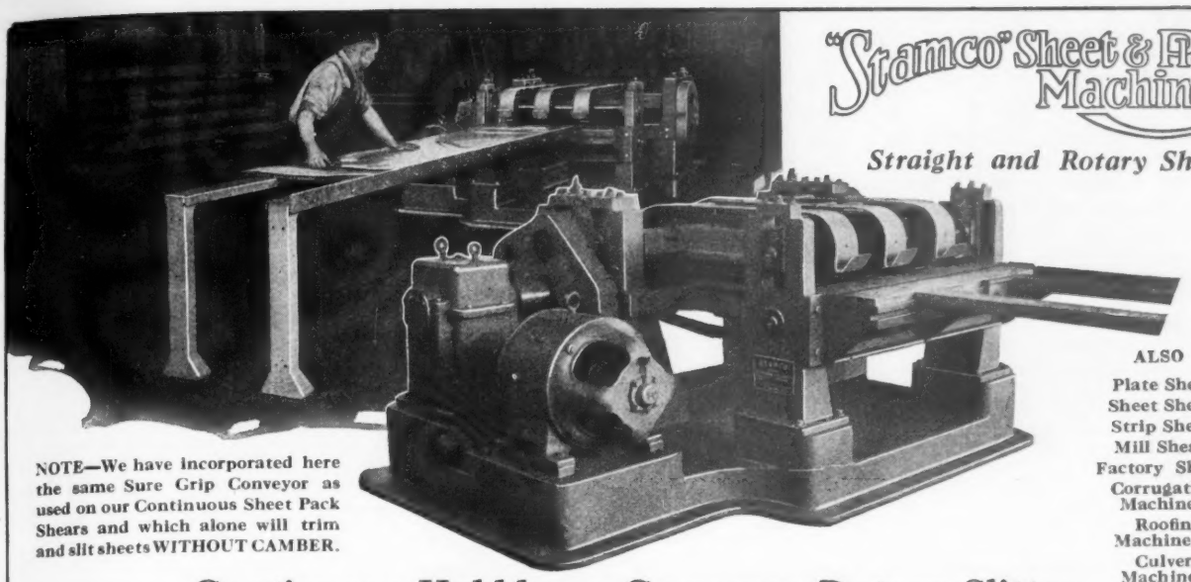
ORDWAY—Southern Colorado Power Co., Pueblo, Colo., plans to build a substation here at a cost of about $75,000.

## Arizona

TUCSON—War department, Washington, plans to build a hangar with repair facilities at municipal airport. Approximate cost, $53,000.

## Pacific Coast

BURBANK, CALIF.—United Airports Co. of California Ltd., T. F. Hamilton president, has awarded contract for the design and construction of a machine shop building at United airport here to Austin Co., 16112 Eu-



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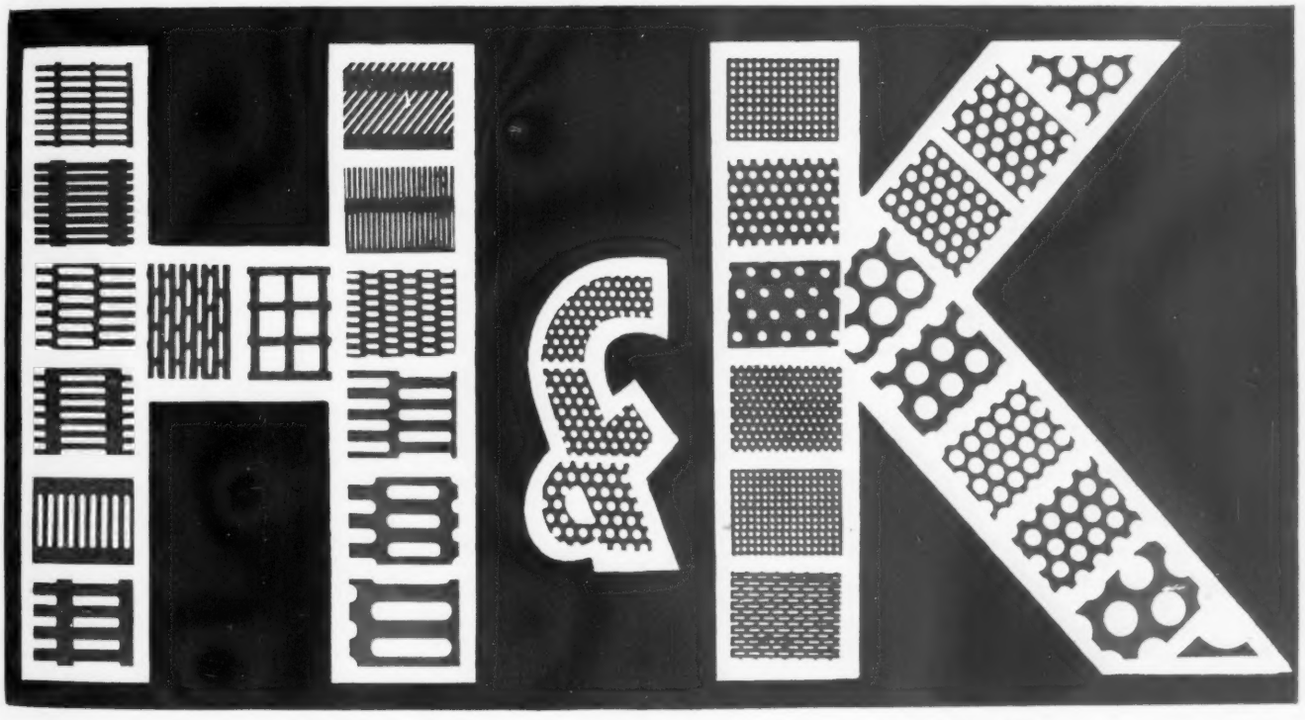

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clid avenue, Cleveland. Shop will be 30 x 240 feet and will cost about $50,000. Western Air Express is lessee.

LOS ANGELES—Pacific Hardstone Brick Co., 416 West Eighth street, will construct a new plant, to include a machine shop. Cost is estimated at $70,000.

LOS ANGELES—Pacific Coast Steel Corp., 215 Market street, San Francisco, plans plant expansion on a new site at Slauson avenue and Atlantic boulevard. Additional open hearth, angle mill and forge press facilities are proposed.

LOS ANGELES—Braun Corp., 363 New High street, manufacturer of scientific apparatus and laboratory equipment, proposes to build a 2-story, 85 x 400-foot distributing plant. Walker & Eisen, Western Pacific building, are architects. Cost is estimated at $90,000, with equipment.

MARE ISLAND, CALIF.—Bureau of supplies and accounts, navy department, Washington, will receive bids May 26 on schedule 5692 for one motor-driven, high-power, plain vertical milling machine.

SAN DIEGO, CALIF.—Dual Aircraft Motors Ltd., F. Van Bazel president, plans to manufacture airplane motors here, in the former Bowlus sailplane plant. Company recently was incorporated with $125,000 capital. Frank K. Baader is vice president and W. O. Vincelette is secretary.

WOODLAND, CALIF.—J. W. Bird Co. will build a 1-story plant for the production of deep well pumping machinery, at a cost of $35,000. H. C. Schrader is general manager.

MARSHFIELD, OREG.—Coos Bay Iron Works Inc., whose foundry recently was damaged by fire, advises through J. S. Lyons, vice president and manager, that the company will completely rebuild, and install a small steel foundry in place of the former cupola. (Noted May 7.)

## Dominion of Canada

VANCOUVER, B. C.—Northwestern Mfg. Co. Ltd. will start production in a plant at 2781 West Fourth avenue, producing electric refrigerators. Oil burners will be manufactured later. A. E. Downey is president, D. K. Parker manager and C. D. Robinson chief engineer.

BOLTON, ONT.—Village plans construction of a waterworks system, including a pumping station and installation of pumps. Estimated cost, $25,000.

LONDON, ONT.—A. B. Greer & Sons Ltd. has made arrangements with an American manufacturer for the manufacture of motor hearses. Some new equipment will be required for the local plant.

LONDON, ONT.—Canada Culvert Co., 387 Hale street, whose incorporation recently was noted, advises through C. S. Parker, president, that the company has installed machinery in a plant leased in East London, and will manufacture and sell corrugated steel culverts. Ontario Farmers Drainage Co. Ltd. is an associated company. (Noted May 7.)

OTTAWA, ONT.—Secretary of city council will receive bids until June 4 for equipment in connection with erection of a new waterworks and filtration plant at Lemieux island, to cost $1,350,000. Diesel engines are included. F. C. Askwith, city hall, is commissioner of works.

TORONTO, ONT.—Schlegel Co. of Canada Ltd., subsidiary of Schlegel Mfg. Co., Rochester, N. Y., manufacturer of automobile body trimmings, has leased space in a building at 163 Dufferin street for establishment of a plant. George Odell will be in charge.

# New Trade Publications

CLAMSHELL BUCKET—Erie Steel Construction Co., Erie, Pa., has issued a bulletin on its hook-on or single line type of clamshell bucket. It is illustrated and details and specifications are given.

SHEET METAL TOOLS—Bulletin No. 75 by the Niagara Machine & Tool Works, Buffalo, N. Y., is devoted to hand and power-operated rotary machines for various operations in sheet metal fabrication.

CARBON PRODUCTS — Boxill-Bruel Carbon Co., Columbia Park, O., has prepared its Catalog No. 12, in loose-leaf form. It contains a list of standard and special brushes for motors, generators and rotary converters, with coding system and instructions for ordering.

CENTRIFUGAL PUMPS — Hayton Pump & Blower division of the International-Stacey Corp., Connersville, Ind., has issued a bulletin, No. 160-B10. It describes its centrifugal pumps, open impeller multistage type. Illustrations show the pumps and interior details.

INDUSTRIAL CARS—Bulletin No. 1239 by the Atlas Car & Mfg. Co., Cleveland, covers its automatic and remote control cars for use where central control is desirable and economical. Various types of cars are illustrated and described.

MATERIALS HANDLING — Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O., shows in a current bulletin various applications of its tramrail for moving parts and materials in the automotive field.

ALUMINUM ALLOY—Apex Smelting Co., Chicago, in Bulletin No. 1 announces an alumihum alloy it has perfected, of low specific gravity, great ductility and high strength, corrosion resistant and of fine surface for polishing and plating. The bulletin gives its characteristics and mechanical properties.

CHEMICALS—A modernized price list, convenient for the pocket or pigeon-hole, has been issued by the Roessler & Hasslacher Chemical Co., Niagara Falls, N. Y. It is to be renewed quarterly, replacing the monthly list issued the past 40 years. Included are chemicals used in case hardening, heat treatment of steel and other industries.

CULVERT BANDS—Armco Culvert Manufacturers association, Middletown, O., in a current bulletin presents the merits of its culvert connecting bands for uniting sections of corrugated culvert pipe. Illustrations show method of loosening the band to slip over corrugations and simple means of tightening to fit closely and form a secure joint.

PUMPS—Brown & Sharpe Mfg. Co., Providence, R. I., has published a circular listing its complete line of pumps of gear, vane and centrifugal types for various requirements. It includes pumps for hydraulically-operated machines, for supplying liquids under pressure, for circulation and for furnishing coolants for machine tools. Engineering data and much useful information are included.

DIESEL ENGINES—Cooper-Bessemer Corp., Mt. Vernon, O., is distributing a folder containing illustrations and specifications of a new stationary type of diesel engine, with 3, 4, 6 or 8 cylinders, with rated horsepower from 150-180 to 400-480 at 300-360 revolutions per minute. An innovation is placing of the spray valves and driving levers directly below the camshaft, easily reached from the engine platform.

ELECTRICAL DEVICES — Electric Controller & Mfg. Co., Cleveland, has prepared a number of bulletins for inclusion in its loose-leaf catalog: No. 910, separator magnets; No. 1042-G, 110-550-volt automatic compensators; No. 1062, 2300-volt magnetic contactors; No. 1088, motor field rheostats and relays for adjustable speed direct current motors; No. 1105, push buttons, standard, vapor-proof and explosion-proof.

GENERATORS—A circular, No. 1908, of the Westinghouse Electric & Mfg. Co., Pittsburgh, is devoted to small generator units and their application. It describes four types of generators where a small supply of energy is needed and central station service is not available. They are discussed from the standpoint of machines and of application. The types include belt-driven, turbine-generator, portable gas engine-driven and electric service. A table of specifications covers various sizes of each class.